EARTHSCAPE HORTICULTURAL SERVICES
Arboricultural, Horticultural and Landscape Consultants

ABN 36 082 126 027

ARBORICULTURAL IMPACT ASSESSMENT REPORT

MAITLAND CITY ADMINISTATION CENTRE

263-283 HIGH STREET, MAITLAND

April 2019

Prepared for: Mr Aaron Cook
Senior Project Architect
Infrastructure and Works, Maitland City Council
279-287 High Street
MAITLAND NSW 2320

Ph:- 02 4934 9630

Prepared by: Andrew Morton
Dip. (Arboriculture) [AQF Level 5]
B. App. Sci. (Horticulture)
A. Dip. App. Sci. (Landscape)

EARTHSCAPE HORTICULTURAL SERVICES
Ph: - 0402 947 296

Member of Arboriculture Australia
Member International Society of Arboriculture - Australian Chapter (ISAAC)
Member Local Government Tree Resources Association (LGTRA)

PO Box 364, BEROWRA NSW 2081
Ph: (02) 9456 4787 Mobile: 0402 947 296 Fax: (02) 9456 5757
Email: earthscape@iinet.net.au

TABLE OF CONTENTS

1 INTRODUCTION

1.1.1 This report was commissioned by Maitland City Council to assess the health and condition of approximately fifty (50) trees located within the 'Civic Precinct' of Maitland, in the vicinity of the Maitland Town Hall and Council Administration Centre, 263-283 High Street, Maitland, NSW. The report has been prepared to aid in the assessment of a Development Application (DA) for development of a new City Administration Centre together with associated infrastructure including on-grade car parking facilities and landscape works.

1.1.2 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.

1.1.3 This report has been prepared in accordance with Maitland Council's requirements for preparation of Arborists reports as outlined in Part B, Section B.5 of the *Maitland Development Control Plan 2013* (MDCP) 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 Civic Precinct is comprised of a number of allotments described as follows:-

- Lots 412 & 413 in DP 1095071, Lots 414 & 415 in DP 1096629, Lot 1 in DP 41991 and Lot 666, 667 & 668 in DP 1096570 (Maitland City Council Chambers);
- Lot 665 in DP 553448, Lot 15 in DP 1131435, Lot 663 in DP 1096616 (associated on-grade car park at rear of the Council Chambers);
- Lot 1 in DP 117532 (Maitland Town Hall) [277-283 High Street];
- Lot 10 in DP 1096416 (on-grade carpark at rear of Town Hall);
- Lot 11, 12 & 13 in DP 1096416 and Lot 1 in DP 46798 (Senior Citizens Centre);
- Lot 1 in DP 1145290 (residential property – 3 Grant Street)
- Lot 2 & 3 in DP 1125681 (open space, park on the corner of Grant and Devonshire Street);
- Lot 1 in DP 996579 (vacant lot, 22 Devonshire Street)
- Lots 41 & 42 in DP 108450 and Lot 5 in DP 56486 (residential flat building, 18 Devonshire Street);
- Lot 18 in DP 540622 (vacant lot used for overflow carparking, corner High Street and Devonshire Street) [263 High Street];
- Lot 14 in DP 1096416 (on-grade carpark, central to the site);
- Lots 6 & 7 in DP 1096694 and Lot 4 in DP 50958 (vacant lots, 271-275 High Street);
- Lot 51 in DP 1095739 (two storey dwelling, shop); and
- Lot 23 in DP 1096701 (City of Maitland Municipal Council Offices)

2.1.2 For the purposes of this report, the subject allotments will be referred to as 'the site'. The total area of the site is approximately 15,330 m². The site is zoned Mixed Use [B4] under the *Maitland Local Environmental Plan 2011* (MLEP). The site contains the City Town Hall, Council Chambers, Council Offices and Senior Citizens Centre together with a number of on grade car parking areas, vacant allotments, a small residential flat building, a former dwelling/shop and a residential cottage. The site is relatively flat with a slight southerly gradient. The site contains a number of mature and semi-mature trees. These include a variety of non-local native and exotic (introduced) species.

2.1.3 The soils of this area are typical of the Rivermead Soil Landscape Group (as classified in the *Soil Landscapes of the Newcastle 1:100,000 Sheet*), consisting of "deep (greater than 2000 mm), well-

drained *Yellow Earths* and *Red Earths* and shallow (<350mm) to deep (>2000mm) moderately well to imperfectly drained *Brown Podzolic Soils* with some *Chocolate Soils* and deep (>1300mm) moderately well-drained *Brown Clays".* The landscape of this area generally consists of moderately broad to extensive, level to gently undulating alluvial terraces in the Hunter Plain with slopes of 0 to 4%.[1]

2.1.4 The original vegetation of this area consisted of tall open forest which cleared from the 1820's for agricultural use and later for urban development. The dominant locally-indigenous tree species formerly found in this area included *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus moluccana* (Grey Box). There are no locally-indigenous tree species remaining within the site.

3 SUBJECT TREES

3.1.1 The subject trees were inspected by Earthscape Horticultural Services (EHS) on the 30th November 2018. 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 Maitland City Council Infrastructure and Works dated May 2018. The numbers used on this plan correlate with the Tree Assessment Schedule (**Appendix 3**). Tree No.s T8, T9, T10, T11, T12, T13, T14, T15, T16, T17, T20, T44, T45, T46, T47, T48 & T49 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.[2] 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 a metric tape and an average taken.
- Trunk diameter (measured 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).
- 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.
- 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 Expectancy[3] 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

Prescribed Trees within the Maitland Local Government Area (LGA) are protected under the provisions of Part B, Section B.5 of the *Maitland Development Control Plan 2013* (MDCP) made pursuant to Clause 9 of the *State Environmental Planning Policy (Vegetation in Non-rural Areas) 2017* (SEPP VNRA). The MDCP generally protects all tree species with a height of three (3) metres or greater, or a branch spread of three (3) metres or greater and a trunk diameter of 100mm or greater (measured at 1.0 metre above Ground Level). All of the subject trees are protected under the provisions of the MDCP.

5.2.2 Wildlife Habitat

All of the trees are exotic (introduced) or non-local native species that would be of some 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) [T8] and *Ligustrum lucidum* (Broad-leaf Privet) [T9] is scheduled as a potential 'Biosecurity Risk' ('Priority Weed' – formerly 'Noxious Weed') within 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.

None of the other trees are listed as Environmental Weed Species within the Maitland LGA.

5.2.4 Threatened Species & Ecological Communities

None of the subject 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*.

5.3 Heritage Significance

5.3.1 Heritage Items

The Maitland Town Hall, including the adjacent office building and supper room located within the site, is listed as an item of Environmental Heritage [Item 156] under Schedule 5, Part 1 of the *Maitland Local Environmental Plan 2011* (MLEP). The Town Hall building is described as a Victorian Classical style civic building constructed c.1860's.[4]

5.3.2 Heritage Conservation Area

The site is located within a Heritage Conservation Area (HCA) [Area C2 -Central Maitland HCA) under Schedule 5, Part 2 of the MLEP 2011.

5.3.3 Significant Tree Register

None of the subject trees are listed on Maitland Council's Significant Tree Register.

5.3.4 General

None of the subject trees have any known or suspected heritage significance. The row of Jacarandas on the north-western and south-western sides of the car park at the rear of the Council Chambers [T30, T31, T32, T33, T34, T35 & T37] appear to have been planted about the same time c. 1970. These trees make a positive contribution to the amenity of the streetscape in this area. The Jacaranda located centrally within the site [T19] appears to be an older specimen, perhaps dating back to 1940-1960. This is a large tree (about 16 metres in height and more than 20 metres crown spread) and is a dominant landscape element within the site.

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

	Landscape Significance Rating						
Estimated Life Expectancy	**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 PRIORITES.

RETENTION VALUE	RECOMMENDED ACTION
"High"	These trees considered worthy of preservation; as such careful consideration should be given to their retention as a priority. 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. 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.
"Moderate"	The retention of these trees is desirable, but not essential. These trees should be retained as part of any proposed development if possible. However, these trees are considered less critical for retention. 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**).
"Low"	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. These trees should not be considered as a constraint to the future development of the site.
"Very Low"	These trees are considered potentially hazardous or very poor specimens, or may be environmental or noxious weeds. The removal of these trees is therefore recommended regardless of the implications of any proposed development.

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).[5]

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.

8 PROPOSED DEVELOPMENT

8.1.1 The proposed development includes the redevelopment of the Maitland City Administration Centre, including new car parking and landscape improvements to the whole Civic Precinct (bounded by High, Devonshire, Grant and Albert Streets).

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
Stormwater Drainage Plans	Lindsay Dynan	14676 DA-0001 to 0012 [B]	30/03/2019
Landscape Development Application (report and plans)	Urbis		02/04/2019
Architectural Drawings	BVN	AR-B-XX-00 [A]	22/02/2019

9.1.2 A summary of the impact of the proposed development on each tree within the site is shown in **Appendix 5**. 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 twenty-four (24) trees of low and very low retention value. These include Tree No.s T4 (Willow Bottlebrush), T5 (Laurustinus), T6 (Crepe Myrtle), T8 (Camphor Laurel), T9 (Broad-leaved Privet), T11 (Lemon-scented Tea Tree), T14 (Japanese Maple Maple), T15 (Umbrella Plant), T21, T22, T23, T24, T26, T38 & T44 (Weeping Bottlebrush), T25 (Prickly Paperbark), T27 (Italian Cypress), T36 (Ornamental Flowering Plum) and T28, T29, T40, T41, T42 & T43 (Jacarandas). 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 six (6) trees of moderate retention value. These include Tree No.s T2 (Arborvitae), T3 & T7 (Monterey Pine), T13 (Japanese Maple), T31 & T37 (Jacaranda). 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**. Consideration has been given to the modification of the vehicular entry/exit points to the new car park in order to retain T31 & T37 and the integrity of the row of Jacarandas along Albert and Grant Streets. However, this modification was not considered viable by Council.

9.1.5 The existing asphalt pavement (public footpath) is proposed to be demolished surrounding T1 (London Plane tree) and proposed new porous pavement is proposed to be installed in a similar footprint. It should be noted that the existing pavement is raised in parts due to uplifting by underlying roots. Excavation for the new pavement sub-grade has the potential to result in severance and damage to woody surface roots, which may result in an adverse impact on this tree. However, any adverse impact on this tree can be avoided by undertaking the demolition of the existing pavement surface in accordance with **Section 10.5**, undertaking all excavations for the

pavement sub-grade in accordance with **Section 10.6** and installing the new pavement slightly above grade where required to avoid severance and damage to woody roots in accordance with **Sections 10.8 & 10.9**. Trunk protection boarding should also be installed in accordance with **Section 10.4**.

9.1.6 The proposed new building is located within the TPZ of T1 (London Plane tree). Excavations for the building foundations are likely to result in severance and damage to woody roots, which is likely to result in an adverse impact on this tree. Substantial canopy pruning will also be required to accommodate the building envelope and temporary scaffolding, resulting in 30-50% crown loss. This is also likely to result in an adverse impact on the health of the tree and diminish its amenity value. Consideration has been given to relocating the building further from the tree to reduce the encroachment, but this is not considered a viable option. In order to *minimise* adverse impact on this tree, all excavations for the building foundations within the TPZ should be undertaken in accordance with **Section 10.6**. Consideration should be given to installing pier and beam footings where possible to bridge over any underlying woody roots in accordance with **Section 10.6**. Any required temporary scaffolding should be erected in accordance with **Section 10.14** and any required canopy pruning (that essential to clear the scaffolding and building façade) should be undertaken in accordance with **Section 10.11**.

9.1.7 Proposed new stormwater pipelines are located within the TPZs of Trees T10 (Cheese Tree), T19 & T30 (Jacarandas). In the case of T19 & T30, open trenching for the pipelines will result in an encroachment to the TPZ of less than 20% of the TPZ and is located outside the SRZs within the footprint of the existing asphalt car park. This work should not result in any adverse impact on these trees, provided that trenching within the TPZs in accordance with **Section 10.7**. In the case of T10, open trenching for the pipeline is located within an existing soft landscape area within the SRZ/TPZ. Open trenching at this proximity is likely to result in severance of woody roots, leading to an adverse impact on this tree. Consideration has been given to relocating the pipeline further from the tree or installing by sub-surface boring. However, neither of these options were considered to be viable by Council. In order to *minimise* adverse impact on this tree, all open trenching within the TPZ should be undertaken by non-destructive excavation methods in accordance with **Section 10.7**, under the supervision of a qualified arborist [AQF 5].

9.1.8 Existing kerb and gutter and asphalt pavements are proposed to be demolished within the TPZs of T12 (Cotton Palm), T18 (Washington Palm), T19, T30, T32, T33, T34, & T35 (Jacarandas) and T39 (Norfolk Island Pine). In the case of Trees T32, T33, T34, T35 & T39, the new kerb, gutter and pavements will be installed further from the trees within existing paved areas (resulting in a decrease in the present encroachment to the TPZ and increase in surrounding soft landscape). This work will not result in any adverse impact on these trees, provided that all such demolition is carried out in accordance with **Section 10.5** and all excavations for the new kerb & gutter foundations are undertaken in accordance with **Section 10.6**. In the case of T12, T18, T19 & T30, the new kerb line and pavements are located at closer proximity to the trees than the existing kerbs and pavements, resulting in an increase in the encroachment. Excavation for the kerb and pavement foundations within the SRZs of these trees has the potential to result in root severance and damage, leading to an adverse impact on these trees. Consideration has been given to amending the car park layout to minimise these encroachments. However, these options were not considered feasible. In order to *minimise* adverse impact on these trees, all excavations for the kerb foundations and pavement sub-grade within the TPZs should be undertaken in accordance with **Section 10.6**. It is recommended that car park bays 83 & 84 be eliminated from the TPZ of T30 and located in another part of the site if possible.

9.1.9 Proposed new pathways are located within the TPZs of Trees T18 (Washington Palm), T19 (Jacaranda) and T20 (NZ Christmas Bush) over existing soft landscape areas. Excavation for the new pavement sub-grade has the potential to result in severance and damage to woody roots of these trees, which may result in an adverse impact. In order to *minimise* any adverse impact on

these trees, all excavations for the pavement sub-grade should be undertaken in accordance with **Section 10.6** and the new pavement surface should be installed slightly above grade where required to avoid severance and damage to woody roots in accordance with **Sections 10.8 & 10.9.**

9.1.10 No other trees will be adversely affected by the proposed development.

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 Protection Fencing

10.3.1 Trees [**T10, T12, T19, T32, T33, T34 & T35**] 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.

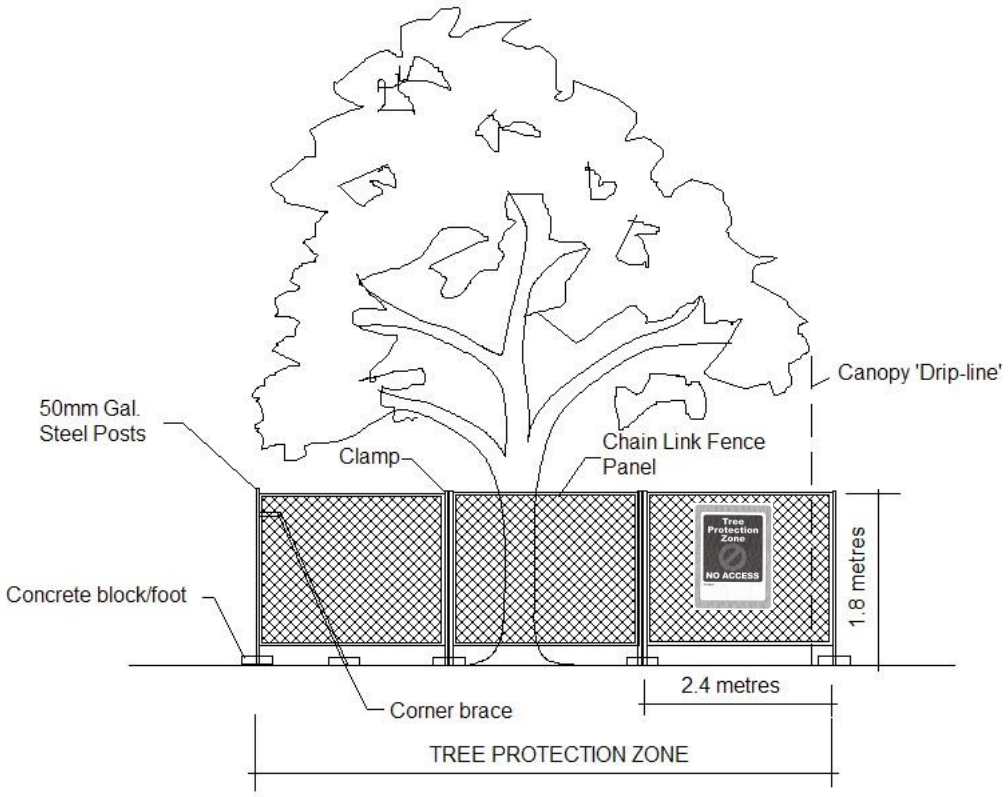


Figure 1 – Detail of Tree Protection Fence

10.3.2 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

10.4 Trunk Protection

10.4.1 Trunk protection boarding shall be erected around Trees [**T1, T18, T30 & T39**] to avoid accidental damage, as indicated on the Tree Protection Plan (**Appendix 6**). The trunk protection shall consist of a layer of carpet underfelt (or similar) wrapped around the trunk, followed by 1.8 metre lengths of softwood timbers (90 x 45mm in section) aligned vertically and spaced evenly around the trunk at 150mm centres (i.e. with a 50mm gap) and secured together with 2mm galvanised wire or galvanised hoop strap as shown in **Figure 3**. Recycled timber (such as demolition waste) may be suitable for this purpose, subject to the approval of the Project Arborist. The timbers shall be wrapped around the trunk (over the carpet underfelt), but not fixed to the tree to avoid mechanical injury or damage to the trunk. Trunk protection should be installed prior to any site works and maintained in good condition for the duration of the construction period. Carpet underfelt (alone) is sufficient for trees with a trunk diameter of less than 200mm. This shall be wrapped around the trunk in a double layer and held in place with heavy-duty fibre reinforced adhesive tape (e.g. Gaffer Tape).

Figure 3 – Detail of Trunk Protection

10.5 Demolition Works within Tree Protection Zones

10.5.1 Demolition of paved areas within the Tree Protection Zones (TPZs) of trees [**T1, T12, T17, T18, T19, T30, T32, T33, T34, T35 & T39**] shall be undertaken under the supervision of a qualified Arborist [Australian Qualification Framework (AQF) Level 5].

10.5.1 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. 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 10.15**.

10.5.2 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.

10.5.3 Following removal of the pavement surface and sub-base, clean, friable topsoil shall be used to fill in the excavated area (within new landscape areas) and bring flush with surrounding levels. 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 and supplied and spread in accordance with **Section 10.10**. Any imported soil material should be similar in texture to the existing site topsoil.

10.5.4 Demolition of existing walls, kerbs and other structures within the TPZ of trees [**T1, T12, T17, T18, T19, T30, T32, T33, T34, T35 & T39**] shall be undertaken under the supervision of a

qualified Arborist [AQF level 5]. The structures shall be demolished using equipment on stationed outside the TPZ where possible or within the footprint of existing hardstand areas.

10.5.5 Care shall be taken to avoid the root systems, trunks and lower branches of trees in the vicinity of the structures during demolition works, with special attention required during demolition of the footings and other sub-surface members to avoid damage to woody roots. An observer ('spotter') shall be employed to assist the plant operator in order to detect and avoid damage to underlying woody roots during demolition. Trunk and/or branch protection shall be installed where there is a potential risk of damage to trees in proximity or overhead of the work.

10.6 Excavations within Tree Protection Zones

10.6.1 Prior to any mechanical excavations for building foundations or pavement sub-grade within the TPZs of Trees [**T1, T12, T17, T18, T19, T20, T30, T32 & T33**] 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. 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.

10.6.2 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.

10.6.3 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.

10.6.4 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.

10.7 Underground Services

10.7.1 Trenching for underground services and stormwater pipes within the TPZs of Trees [**T10 & T30**], 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.

10.7.2 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.

10.8 Pavements

10.8.1 Proposed paved areas within the TPZs of Trees [**T1, T17, T18, T19, T20 & T30**] shall be placed at or slightly above grade where possible to minimise excavations within the root zone and avoid severance and damage of woody roots. The pavement sub-base material should be supplied and installed in accordance with **Section 10.9**.

10.9 Pavement Sub-base

10.9.1 Pavement sub-base material within TPZs of trees [**T1, T17, T18, T19, T20 & T30**] shall be a coarse, gap-graded material such as 20 – 50mm crushed basalt (Blue Metal) or equivalent no-fines gravel material to provide some aeration and moisture permeation to the root zone. Note that road base or crushed sandstone or other similar material containing a high percentage of fines is unacceptable for this purpose. The fill material should be consolidated using a non-vibrating roller or similar to minimise compaction of the underlying soil. A permeable geotextile may be used beneath the sub-base to prevent migration of the stone into the sub-grade and provide greater load capacity.

10.10 Placement of Fill Material

10.10.1 Fill material placed within the TPZs of Trees [**T32, T33, T34, T35 & T39**], (to restore levels in new landscape areas following demolition of existing structures and pavements) shall be a well-drained friable material, equivalent in texture to the existing site topsoil material. The fill should be free from rocks, vegetation and other extraneous material complying with AS 4419:2003 (*Soils for Landscaping and Garden Use*).

10.10.2 The fill may be lightly consolidated, but shall not be compacted to engineering standards. No fill material should be placed in direct contact with the trunk.

10.10.3 Plant and equipment used to place and spread fill material should be stationed outside the TPZ where possible. Where not possible, suitable ground protection should be installed in accordance with **Section 10.14** to avoid compaction of the underlying soil profile and root zone.

10.11 Canopy & Root Pruning

10.11.1 Canopy pruning of Trees [**T1**] (that essential to clear the building envelope and temporary scaffolding) shall be carried out in accordance with Australian Standard 4373-2007 – *Pruning of Amenity Trees*. All pruning work shall be carried out 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 branches of greater than 100mm in diameter should be removed or pruned without further advice from a Consulting Arborist [Australian Qualification Framework Level 5].

10.11.2 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. All root pruning work shall be carried out 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].

10.12 Tree Damage

10.12.1 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.

10.12.2 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.

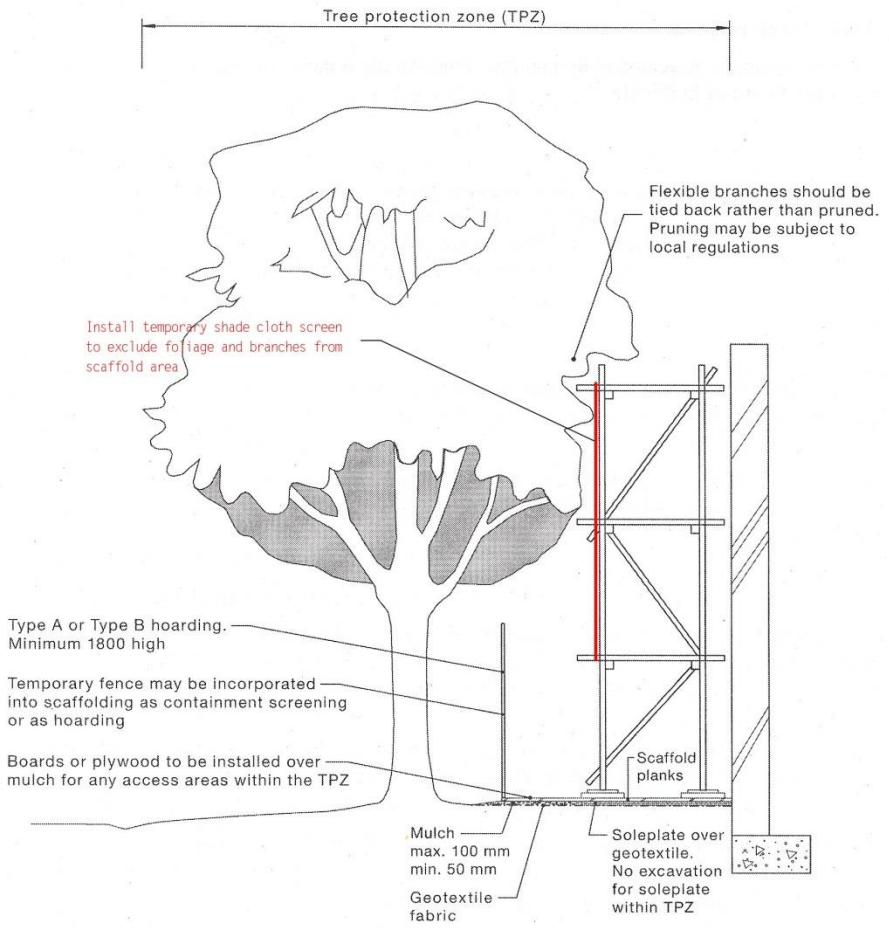
10.13 Tree Removal

10.13.1 The removal of Trees [**T2-T9, T11, T13, T14, T15, T21-T29**] 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.

10.13.2 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.

10.14 Temporary Scaffolding

10.14.1 Where temporary scaffolding must be erected within the TPZ of trees [**T1**] (as indicated in **Appendix 6**), the scaffold shall be erected in accordance with **Figure 5**. Where foliage or branches project through the scaffold and create a safety hazard, this foliage and branches shall be temporarily excluded from the inner part of the scaffold by affixing a shade cloth screen on the outside of the scaffold **(**refer to **Figure 5)**, or alternatively temporarily tying back branches where required. The pruning or removal of branches to accommodate the scaffold should be avoided wherever possible. Suitable ground protection shall be installed beneath the scaffold as shown in **Figure 5** to prevent contamination, disturbance and compaction of the soil profile within the scaffold zone during construction.



NOTE: Excavation required for the insertion of support posts for tree protection fencing should not involve the severance of any roots greater than 20 mm in diameter, without the prior approval of the project arborist.

Figure 5 - Detail of Temporary scaffolding within a Tree Protection Zone

10.14.2 Where pruning or removal of branches to accommodate temporary scaffolding is unavoidable, all such pruning work shall be undertaken in accordance with **Section 10.8**.

10.15 Ground Protection

10.15.1 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 6** shall be placed over the top of the ground surface to minimise compaction and disturbance of the underlying soil profile and root zone.

Figure 6 – Showing typical detail for truck mats.

10.15.2 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.

11 REPLACEMENT PLANTING

11.1.1 In order to compensate for loss of amenity resulting from the removal of trees to accommodate the proposed development, a minimum number of thirty (30) new trees capable of attaining a height of at least ten (10) metres at maturity should be planted within the site.

11.1.2 The following species are appropriate to the site conditions and could be considered for replacement planting:-

- *Ficus rubiginosa* (Port Jackson Fig)
- *Tristaniopsis laurina* (Water Gum)
- *Syzygium paniculatum* (Magenta Cherry)
- *Corymbia maculata* (Spotted Gum)
- *Jacaranda mimosifolia* (Jacaranda)
- *Platanus acerifolia* (London Plane)
- *Lophostemon confertus* (Brushbox)
- *Ulmus parvifolia* (Chinese Elm)
- *Toona australis* (Red Cedar)
- *Cedrus deodara* (Himalayan Cedar)
- *Agathis robusta* (Queensland Kauri)
- *Flindersia australis* (Crows Foot Ash)
- *Waterhousea floribunda* (Weeping Lillypilly)

Andrew Morton
EARTHSCAPE HORTICULTURAL SERVICES
2nd April 2019

12 REFERENCES

[1] Chapman GA & Murphy CL (1989)
Soil Landscapes of the Sydney 1:100,000 Sheet
Soil Conservation Service of NSW. Sydney

[2] Mattheck, Dr. Claus & Breloer, Helge (1994) – Sixth Edition (2001)
The Body Language of Trees – A Handbook for Failure Analysis
The Stationery Office, London, England

[3] Barrell, Jeremy (1996)
Pre-development Tree Assessment
Proceedings of the International Conference on Trees and Building Sites (Chicago)
International Society of arboriculture, Illinois, USA

[4] Office of Environment and Heritage (May 2006)
Maitland Town Hall and adjacent Office Building and Supper Room
State Heritage Register – Heritage Database
Office of Environment and Heritage, Sydney.
https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045675

[5] Council of Standards Australia (August 2009)
AS 4970 – 2009 – Protection of Trees on Development Sites
Standards Australia, Sydney

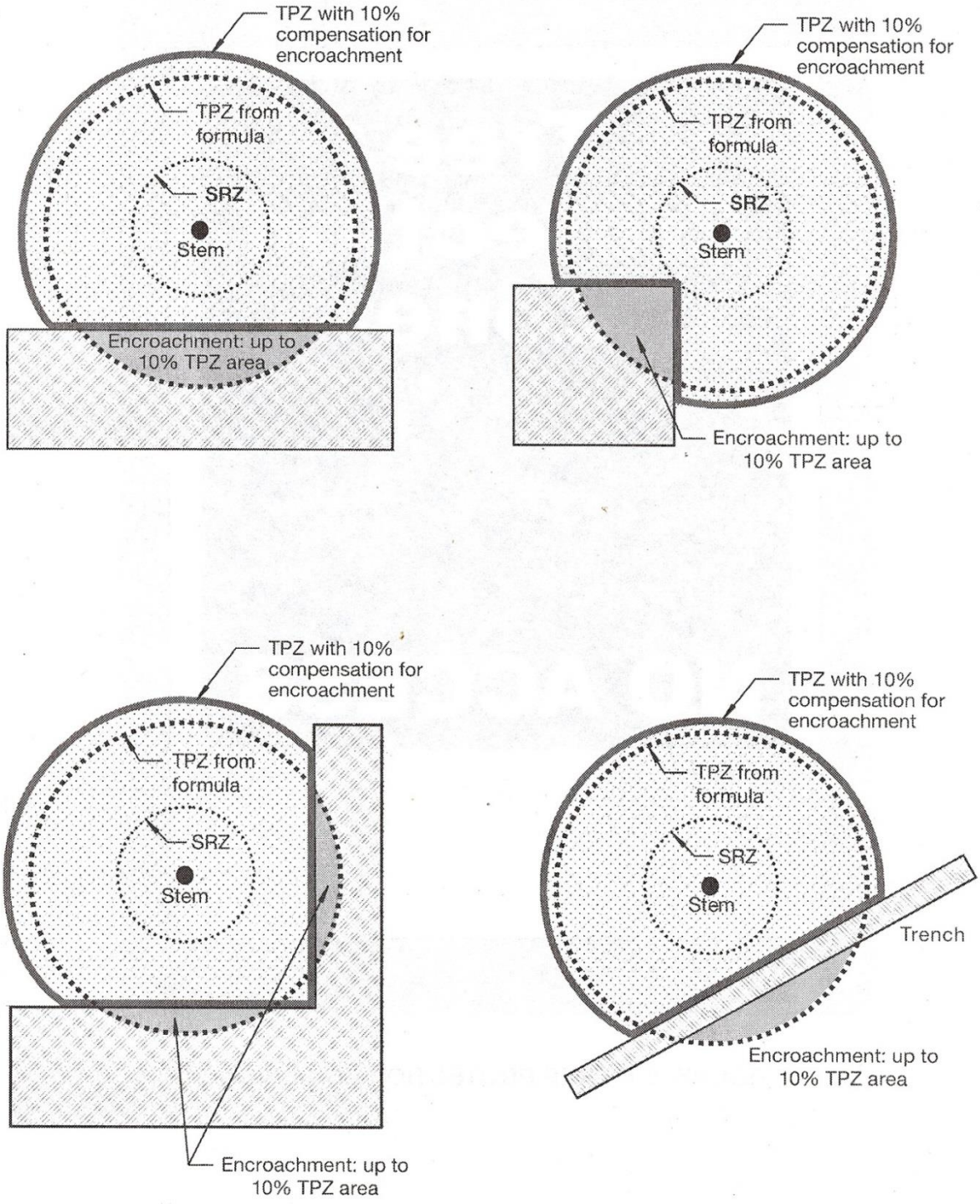
APPENDIX 1 - CRITERIA FOR ASSESSMENT OF LANDSCAPE SIGNIFICANCE

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 Species as defined under the Threatened Species Conservation Act 1995 (NSW) or the Environmental Protection and Biodiversity Conservation Act 1999	The subject tree has a very large live crown size exceeding 300m² 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 200m²; 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 100m²; 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 this DCP.	The subject tree has a medium live crown size exceeding 40m²;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 this DCP 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 40m² 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 visible habitat value	The tree is a declared Noxious Weed under the Noxious Weeds Act (NSW) 1993 within the relevant Local Government Area.	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)	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	***Platanus acerifolia*** (London Plane)	16	15	732	210	M	Appears stable with sound branching structure. Located within asphalt pavement (footpath). Minor pavement deformation due to roots. Concrete kerb replaced with thickened asphalt edge east side	Selectively pruned north side to clear light pole	Very Good	Low foliar insect infestation (Sycamore Lace Bug)	Long - more than 40 years	3	**High**	Nature strip
2	***Thuja occidentalis*** (American Arborvitae)	8	7	450	49	M	Appears stable with fair branching structure. Exhibits multiple moderate bark inclusions at junctions of PLs & SLs at 1-2 metres	Selectively pruned south side to clear ABC. SLs topped.	Good	No Evidence	Medium 15-40 Years	4	**Moderate**	On-site
3	***Pinus radiata*** (Monterey Pine)	14	13	860	156	M	Appears stable with fair branching structure. Exhibits some dieback with 15% interior crown deadwood. Multiple mechanical injuries to woody surface roots (grass cutting). Large basal wound due previous branch failure with decay evident	Multiple PLs removed (pruned to trunk)	Fair with slightly thinning crown	No Evidence	Short 5-15 Years	3	**Moderate**	On-site
4	***Callistemon salignus*** (Willow Bottlebrush)	3	3	200x2 + 150	9	OM	Appears stable with poor branching structure. Exhibits multiple epicormics arising from old stump.	Previously cut to stump at 1 metre	Good	No Evidence	Transient (less than 5 years)	5	**Very Low**	On-site
5	***Viburnum tinus*** (Laurustinus)	3	4	70x10	12	M	Appears stable with sound branching structure.	No Evidence	Very Good	No Evidence	Medium 15-40 Years	5	**Low**	On-site
6	***Lagerstroemia indica*** (Crepe Myrtle)	5	8	80x6	40	SM	Appears stable with sound branching structure. Upper crown suppressed due to overshadowing.	Previously lopped at 1.5 metres (crown restored).	Good	No Evidence	Medium 15-40 Years	5	**Low**	On-site
7	***Pinus radiata*** (Monterey Pine)	9	15	990	135	M	Appears stable with fair branching structure. Exhibits some dieback with 15% interior crown deadwood. Multiple extended lateral PLs. Recent branch loss due termite damage. Prominent lean to the north (self-corrected)	Multiple PLs removed (pruned to trunk)	Fair with slightly thinning crown	Suspected termite infestation.	Short 5-15 Years	3	**Moderate**	On-site
8	***Cinnamomum camphora*** (Camphor Laurel)	8	6	180	42	SM	Appears stable with sound branching structure.	No Evidence	Very Good	No Evidence	Long - more than 40 years	7	**Very Low**	On-site
9	***Ligustrum lucidum*** (Broad Leaf Privet)	5	4	150	16	SM	Appears stable with sound branching structure. Crown suppressed on south-west side due to crowding.	No Evidence	Very Good	No Evidence	Long - more than 40 years	7	**Very Low**	On-site

PL = Primary Limb; SL = Secondary Limb;
TL = Tertiary Limb. GL = Ground Level

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm)	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				
10	***Glochidion ferdinandi*** (Cheese Tree)	11	12	430x2	108	M	Appears stable with fair branching structure. Exhibits a moderate bark inclusion at GL.	Crown lifted to 4 metres	Very Good	No Evidence	Long - more than 40 years	3	**High**	On-site
11	***Leptospermum petersonii*** (Lemon-scented Tea Tree)	5	4	250	16	M	Appears stable with poor branching structure. Exhibits multiple epicormic sprouts emanating from old pruning wounds. Poor form and habit.	Previously lopped at 3 metres (crown restored).	Fair	No Evidence	Transient (less than 5 years)	5	**Very Low**	On-site
12	***Washingtonia filifera*** (Cotton Palm)	20	4	400	16	M	Appears stable with sound branching structure. Located close to existing building.	No Evidence	Very Good	Moderate vine infestation (Philodendron sp)	Long - more than 40 years	3	**High**	On-site
13	***Acer palmatum*** (Japanese Maple)	7	10	250	60	M	Appears stable with sound branching structure.	Selectively pruned.	Very Good	No Evidence	Long - more than 40 years	4	**Moderate**	On-site
14	***Acer palmatum*** (Japanese Maple)	6	5	200	25	SM	Appears stable with fair branching structure. Crown suppressed on south-west side due to overshadowing. Located close to existing pathway.	Selectively pruned.	Good	No Evidence	Short 5-15 Years	5	**Low**	On-site
15	***Schefflera arboricola*** (Umbrella Plant)	3	4	100x4	12	M	Appears stable with sound branching structure.	No Evidence	Good	No Evidence	Medium 15-40 Years	5	**Low**	On-site
16	***Leptospermum petersonii*** (Lemon-scented Tea Tree)	6	4.5	150x2	20.25	M	Appears stable with fair branching structure. Exhibits multiple high bark inclusions GL-1 metre. Some dieback with 10% deadwood.	Previously lopped at 3-4 metres (crown restored).	Fair with thinning crown	No Evidence	Short 5-15 Years	5	**Low**	On-site
17	***Leptospermum petersonii*** (Lemon-scented Tea Tree)	6	6	200 + 130x2	27	M	Appears stable with fair branching structure. Crown suppressed on the south-east side due to crowding. Multiple high bark inclusions GL-1 metre.	Previously lopped at 3-4 metres (crown restored).	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
18	***Washingtonia robusta*** (Washington Palm)	16	4.5	455	27	M	Appears stable with sound branching structure. Located in small traffic island. Located close to kerb.	No Evidence	Good	No Evidence	Medium 15-40 Years	3	**Moderate**	On-site
19	***Jacaranda mimosifolia*** (Jacaranda)	16	22	450 + 550 + 720	264	M	Appears stable with fair branching structure. Exhibits multiple moderate bark inclusions at GL at junction of 3 x co-dominant PLs.	Crown lifted to 4 metres & deadwooded.	Fair with thinning crown	No Evidence	Medium 15-40 Years	2	**High**	On-site

PL = Primary Limb; SL = Secondary Limb;
TL = Tertiary Limb. GL = Ground Level

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm)	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				
20	***Metrosideros excelsa* 'Variegata'** (Variegated NZ Christmas Bush)	3	3	100x2	6	SM	Appears stable with sound branching structure.	No Evidence	Very Good	No Evidence	Long - more than 40 years	5	**Moderate**	On-site
21	***Callistemon viminalis*** (Weeping Bottlebrush)	4	5	100 + 120	12.5	SM	Appears stable with sound branching structure.	No Evidence	Very Good	Moderate English Ivy infestation.	Medium 15-40 Years	5	**Low**	On-site
22	***Callistemon viminalis*** (Weeping Bottlebrush)	6	5	180 + 70x2	20	SM	Appears stable with fair branching structure. Exhibits a prominent lean to the south. Moderate wound at 1.5 metres due branch loss (included bark).	No Evidence	Good	No Evidence	Medium 15-40 Years	5	**Low**	On-site
23	***Callistemon viminalis*** (Weeping Bottlebrush)	4	4	120 + 80	10	SM	Appears stable with fair branching structure. Crown suppressed on the north-west side due to overshadowing. Poor form and habit.	Selectively pruned	Good	No Evidence	Short 5-15 Years	5	**Low**	On-site
24	***Callistemon viminalis*** (Weeping Bottlebrush)	4	5	70x2	10	SM	Appears stable with poor branching structure. Crown heavily suppressed on the west side due to overshadowing. Poor form and habit. Small wound at 2 metres due branch loss.	Crown lifted to 3 metres	Fair	No Evidence	Transient (less than 5 years)	5	**Very Low**	On-site
25	***Melaleuca styphelioides*** (Prickly Paperbark)	8	8	320	48	M	Appears stable with fair branching structure. Exhibits multiple minor bark inclusions at 2-3 metres at junctions of PLs & SLs	Selectively pruned	Good	No Evidence	Long - more than 40 years	4	**Moderate**	On-site
26	***Callistemon viminalis*** (Weeping Bottlebrush)	9	5	130x2 + 100	30	SM	Appears stable with fair branching structure. Exhibits multiple trunks arising from GL.	Crown lifted to 3 metres	Good	No Evidence	Short 5-15 Years	5	**Low**	On-site
27	***Cupressus sempervirens* 'Stricta'** (Italian Cypress)	11	1	140	3	I	Appears stable with sound branching structure. Low Live Crown Ratio.	No Evidence	Good	No Evidence	Short 5-15 Years	5	**Low**	On-site
28	***Jacaranda mimosifolia*** (Jacaranda)	10	5	230 + 150	30	SM	Appears stable with sound branching structure. Exhibits a high bark inclusion at GL at junction of PL. Located cloe to edge of path.	Crown lifted to 3 metres	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site

PL = Primary Limb; SL = Secondary Limb;
TL = Tertiary Limb. GL = Ground Level

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm)	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				
29	***Jacaranda mimosifolia*** (Jacaranda)	8	5	162	25	I	Appears stable with sound branching structure. Crown suppressed on the west side due crowding. Very prominent lean to the east.	Previously cut to GL. Crown lifted to 4 metres	Good	No Evidence	Short 5-15 Years	5	Low	On-site
30	***Jacaranda mimosifolia*** (Jacaranda)	11	10	270x3 + 150	70	SM	Appears stable with fair branching structure. Exhibits multiple high bark inclusions at GL.	Crown lifted to 4 metres. Selectively pruned to clear light pole.	Good	Low vine infestation to PLs	Medium 15-40 Years	4	Moderate	On-site
31	***Jacaranda mimosifolia*** (Jacaranda)	8	10	462	50	M	Appears stable with fair branching structure. Exhibits a low bark inclusion at 1.5 metres. Prominent lean to the north (self-corrected). Minor dieback in upper crown with 5% deadwood.	Crown lifted to 3 metres	Fair	No Evidence	Medium 15-40 Years	4	Moderate	On-site
32	***Jacaranda mimosifolia*** (Jacaranda)	11	13	360 + 240 + 225	91	M	Appears stable with sound branching structure. Low bark inclusion at 0.8 metres at junction of PL. Crown suppressed on north-west side due to crowding.	Crown lifted to 4 metres	Good	No Evidence	Long - more than 40 years	3	High	On-site
33	***Jacaranda mimosifolia*** (Jacaranda)	13	15	350 + 600	120	M	Appears stable with fair branching structure. Exhibits a prominent lean to the north-east. Moderate dieback in upper crown with 30% deadwood and 20% epicormic growth. Multiple small basal wounds with decay & mechanical injuries to woody surface roots.	Crown lifted to 5 metres	Fair with thinning crown	No Evidence	Short 5-15 Years	3	Moderate	On-site
34	***Jacaranda mimosifolia*** (Jacaranda)	15	14	330 + 450	154	M	Appears stable with sound branching structure. Minor dieback in upper crown with 5% deadwood.	Crown lifted to 4 metres	Fair with slightly thinning crown	No Evidence	Long - more than 40 years	3	High	On-site
35	***Jacaranda mimosifolia*** (Jacaranda)	14	14	545	154	M	Appears stable with fair branching structure. Exhibits a prominent lean to the north. Crown suppressed on the north-east side due crowding. Low bark inclusion at 0.8 metres.	Crown lifted to 4 metres	Good	No Evidence	Long - more than 40 years	3	High	On-site
36	***Prunus cerasifera* 'Nigra'** (Ornamental Flowering Plum)	5	4	200	20	SM	Appears stable with poor branching structure. Exhibits multiple basal wounds and cavities due borer damage with decay evident.	No Evidence	Fair	High borer infestation	Transient (less than 5 years)	5	Very Low	On-site

PL = Primary Limb; SL = Secondary Limb;
TL = Tertiary Limb. GL = Ground Level

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm)	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				
37	***Jacaranda mimosifolia*** (Jacaranda)	9	10	270 + 360	60	M	Appears stable with sound branching structure.	Crown lifted to 4 metres	Good	No Evidence	Long - more than 40 years	4	**Moderate**	On-site
38	***Callistemon viminalis*** (Weeping Bottlebrush)	6	5	120x3	25	M	Appears stable with poor branching structure. Upper crown suppressed due to overshadowing with poor form and habit.	Selectively pruned	Fair	No Evidence	Short 5-15 Years	5	**Low**	On-site
39	***Araucaria heterophylla*** (Norfolk Island Pine)	22	8	535	164	M	Appears stable with sound branching structure. Exhibits slight lean to the north-west (self corrected). Recent disturbance to root zone due trenching for electrical conduits.	No Evidence	Fair with slightly thinning crown	No Evidence	Medium 15-40 Years	3	**Moderate**	On-site
40	***Jacaranda mimosifolia*** (Jacaranda)	12	7	373	56	SM	Appears stable with poor branching structure. Exhibis multiple moderate wounds and epicormic sprouts arising at 7 metres due to previous pruning.	All PLs & SLs previously lopped to 7 metres (Crown restored).	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
41	***Jacaranda mimosifolia*** (Jacaranda)	16	12	787	120	M	Appears stable with poor branching structure. Exhibis multiple moderate wounds and epicormic sprouts arising at 7 metres due to previous pruning. Moderate wound at 7 metres due branch loss.	All PLs & SLs previously lopped to 7 metres (Crown restored).	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
42	***Jacaranda mimosifolia*** (Jacaranda)	15	9	500	99	M	Appears stable with poor branching structure. Exhibis multiple moderate wounds and epicormic sprouts arising at 7 metres due to previous pruning. Prominent lean to the south.	All PLs & SLs previously lopped to 7 metres (Crown restored).	Fair with slightly thinning crown	No Evidence	Short 5-15 Years	4	**Low**	On-site
43	***Jacaranda mimosifolia*** (Jacaranda)	13	9	646	72	M	Appears stable with poor branching structure. Exhibis multiple moderate wounds and epicormic sprouts arising at 7 metres due to previous pruning.	All PLs & SLs previously lopped to 7 metres (Crown restored).	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
44	***Callistemon viminalis*** (Weeping Bottlebrush)	5	4	160	12	SM	Appears stable with fair branching structure. Exhibits a prominent lean to the north. Located within small raised planter close to existing building.	Crown lifted to 3 metres	Good	No Evidence	Short 5-15 Years	5	**Low**	On-site

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm)	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				
45	***Raphiolepis indica*** (Indian Hawthorn)	7	6	150x3	42	M	Appears stable with fair branching structure.	Crown lifted to 3 metres	Very Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
46	***Callistemon viminalis*** (Weeping Bottlebrush)	11	4	160	36	M	Appears stable with sound branching structure. Located in raised planter close to building. Exhibits a prominent lean to the north-east.	Crown lifted to 3 metres	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
47	***Callistemon viminalis*** (Weeping Bottlebrush)	11	8	160 + 180	72	M	Appears stable with sound branching structure. Located in raised planter close to building. Exhibits a prominent lean to the west.	Crown lifted to 3 metres	Good	No Evidence	Short 5-15 Years	4	**Low**	On-site
48	***Callistemon viminalis*** (Weeping Bottlebrush)	14	11	240 + 330	132	M	Appears stable with fair branching structure. Exhibits a high bark inclusions at GL. Located in raised planter close to building.	Crown lifted to 3 metres	Very Good	No Evidence	Short 5-15 Years	3	**Moderate**	On-site
49	***Magnolia soulangeana*** (Magnolia)	7	6	170	30	SM	Appears stable with sound branching structure.	Crown lifted to 2 metres	Very Good	No Evidence	Long - more than 40 years	4	**Moderate**	On-site

PL = Primary Limb; SL = Secondary Limb;
TL = Tertiary Limb. GL = Ground Level

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
1	***Platanus acerifolia*** (London Plane)	M	8.8	2.9	242.6	Existing asphalt pavement surrounding trunk to be demolished within SRZ/TPZ (note surface roots presently uplifting the pavement). New permeable (porous) pavement proposed within TPZ (within footprint of existing asphalt) at RL8.00 (close to existing grade). Excavations for pavement sub-grade within TPZ/SRZ. No increase in present encroachment. Proposed commercial building offset 3.7 metres west & south at RL 9.335 (1.3 metres above grade). Excavations for building foundations within TPZ/SRZ. Encroachment to TPZ = 28%. Building envelope to RL22.00 (14 metres above grade). Substantial canopy pruning may be required to clear building envelope and any required temporary scaffolding, resulting in 30-50% crown loss.	Excavations for pavement sub-grade have the potential to result in severance and damage to woody surface roots, resulting in an adverse impact, depending on pavement section and construction methodology (TBC). Extent of encroachment to TPZ from building exceeds acceptable limits under AS 4970:2009. Excavations for building foundations are likely to result in an adverse impact on this tree. Extent of canopy pruning required to clear building envelope exceeds acceptable limits under AS 4373:2007, which is likely to result in an adverse impact on the health of the tree and reduce its amenity value (High Retention Value). Consideration has been given to relocating the building further away from the tree to minimise canopy priuning. However this option was not considered feasible by Council.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install trunk protection boarding in accordance with Section 10.4. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ and use porous pavement in accordance with Section 10.6. Consider installing a unit pavement with flexible granular subbase to mound over the existing surface roots and maintain any surface roots intact within the pavement sub-grade in accordance wiith Section 10.9. Undertake all excavations for the building foundations within the TPZ and avoid damage and severance to large woody roots in accordance with Section 10.6. Install temporary scaffolding in accordance with Section 10.14. Undertake any required canopy pruning (that essential to clear the building envelope and temporary scaffolding) in accordance with Section 10.11.
2	***Thuja occidentalis*** (American Arborvitae)	M	5.4	2.4	91.6	Located within footprint of proposed new car parking area.	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.
3	***Pinus radiata*** (Monterey Pine)	M	10.3	3.1	334.3	Located within footprint of proposed new car parking area.	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)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
4	***Callistemon salignus*** (Willow Bottlebrush)	M	4.2	2.1	55.4	Proposed new car park and associated kerb and gutter offset 800mm north-west at RL? (assumed close to existing grade). Excavations for pavement subgrade and K&G foundations within SRZ. Located within alignment of new stormwater pipeline.	Proposed works are likely to result in severance of woody roots, leading to a significant adverse impact.	Remove tree.
5	***Viburnum tinus*** (Laurustinus)	M	2.2	1.5	15.2	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
6	***Lagerstroemia indica*** (Crepe Myrtle)	M	4.2	1.7	55.4	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
7	***Pinus radiata*** (Monterey Pine)	M	11.9	3.3	443.6	Located within footprint of proposed new car parking area.	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.
8	***Cinnamomum camphora*** (Camphor Laurel)	M	3.0	1.6	28.3	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
9	***Ligustrum lucidum*** (Broad Leaf Privet)	M	2.5	1.5	19.6	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
10	***Glochidion ferdinandi*** (Cheese Tree)	M	7.2	2.7	162.8	Proposed new 300mm diameter stormwater pipeline offset 2.2 metres south-west at IL? (assumed 500-800mm below grade). Open trenching for pipeline within TPZ/SRZ. Encroachment to TPZ = 30%.	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Open trenching for stormwater pipeline has the potential to result in severance and damage to woody roots, leading to an adverse impact. Consideration has been given to relocating the pipeline further from the tree or installing by sub-surface boring. However, neither of these options were considered feasible by Council's engineer.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Undertake all open trenching within TPZ using non-destructive excavation methods in accordance with Section 10.7. Install pipeline beneath woody roots in accordance with Section 10.7. Backfill trench with clean fill material in accordance with Section 10.10.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
11	***Leptospermum petersonii*** (Lemon-scented Tea Tree)	M	3.0	1.8	28.3	Proposed new roadway and associated kerb and gutter offset 1.9 metres south-east at RL6.53 (close to existing grade). Proposed new pathway offset 2 metres north-east. Excavations for pavement subgrade and K&G foundations within TPZ. Cummulative encroachment to TPZ = 22%.	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Proposed works are likely to result in an adverse impact.	Remove tree (poor specimen).
12	***Washingtonia filifera*** (Cotton Palm)	G	4.8	2.3	72.3	Proposed new roadway and associated kerb and gutter offset 700mm south-east at RL? (assumed close to existing grade). Proposed new pathway offset 2.8 metres south-west. Excavations for pavement subgrade and K&G foundations within TPZ. Cummulative encroachment to TPZ = 49%.	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Proposed works are likely to result in a significant adverse impact (High Retention Value). Consideraton has been given to maintaining the existing kerb alignment to avoid adverse impact on this tree, but this option was not considered feasible by Council.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install trunk protection boarding in accordance with Section 10.4. Demolish the existing asphalt pavement & K&G within TPZ in accordance with Section 10.5. Undertake all excavations for the new pavement sub-grade & kerb within the TPZ in accordance with Section 10.6.
13	***Acer palmatum*** (Japanese Maple)	M	5.5	1.8	95.0	Proposed new roadway and associated kerb and gutter offset 800mm south-east at RL? (assumed close to existing grade). Excavations for pavement subgrade and K&G foundations within TPZ/SRZ. Encroachment to TPZ = 40%. Substantial canopy pruning required to clear vehicular access.	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Proposed works are likely to result in a significant adverse impact.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
14	***Acer palmatum*** (Japanese Maple)	M	3.5	1.7	38.5	Located within footprint of proposed new roadway and associated kerb and gutter.	Proposed works will necessitate removal.	Remove tree.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
15	***Schefflera arboricola*** (Umbrella Plant)	M	2.4	1.7	18.1	Proposed new roadway and associated kerb and gutter offset 900mm south-east at RL? (assumed close to existing grade). Excavations for pavement subgrade and K&G foundations within TPZ/SRZ. Encroachment to TPZ = 25%. Substantial canopy pruning required to clear vehicular access.	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Proposed works are likely to result in a significant adverse impact.	Remove tree.
16	***Leptospermum petersonii*** (Lemon-scented Tea Tree)	M	2.7	1.8	22.9	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
17	***Leptospermum petersonii*** (Lemon-scented Tea Tree)	M	3.6	2.0	40.7	Existing asphalt pavement and K&G offset 1.6 metres north-east to be demolished within SRZ/TPZ. New concrete footpath pavement offset 2.6 metres north-east. Excavations for new pavement sub-grade within TPZ (within footprint of existing asphalt) at RL? (assumed close to existing grade). Decrease in present encoachment .	No adverse impact provided that all demolition works within the TPZ are undertaken as recommended.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6
18	***Washingtonia robusta*** (Washington Palm)	G	5.5	2.4	93.8	Existing K&G and surrounding asphalt carpark to be demolished within TPZ/SRZ. Located within footprint of proposed new pedestrian pathway (porous pavement).	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Proposed works are likely to result in a significant adverse impact. Proposed to be retained.	Retain in accordance with recommended Tree Protection Measures (Section 10). Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade in accordance with Section 10.6.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
19	***Jacaranda mimosifolia*** (Jacaranda)	M	12.0	3.3	452.2	Existing asphalt roadway and associated K&G offset 2 metres north and 3.4 metres south to be demolished within TPZ. Proposed new asphalt pavement and K&G offset 2.7 metres north and 5.9 metres west within SRZ/TPZ (partially within footprint of existing paved areas, partially with soft landscape area). Excavations for pavement sub-grade within TPZ/SRZ. New porous pavement footpath pavement offset 3.9 metres south-west at RL. Excavations for new pavement sub-grade within TPZ (within footprint of existing soft landscape area) at RL7.43 (close to existing grade). Overall increase in extent of encroachment to TPZ. proposed 450mm diameter stormwater pipeline offset 8 metres north-west at IL? (assumed 500-1000mm below grade). Open trenching for pipeline within TPZ (within footprint of existing road pavement).	Extent of encroachment to TPZ exceeds acceptable limits under AS4970:2009. Excavations for pavement sub-grade and K&G footings for road and footpath are likely to result in severance and damage to woody surface roots, leading to an adverse impact, depending on pavement section and construction methodology (TBC). Consideration has been given to amending the road layout and eliminating the pathway to minimise the encroachment to the TPZ. However, this was not considered feasible by Council. The position of the stormwater pipeline has been relocated as much as practicable to minimise the encroachment to the TPZ.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade & kerb and gutter foundations within the TPZ in accordance with Section 10.6. Undertake all open trenching within TPZ in accordance with Section 10.7.
20	***Metrosideros excelsa* 'Variegata'** (Variegated NZ Christmas Bush)	M	2.0	1.5	12.6	Proposed new pathway offset 0.3 metres north-west. Excavations for pavement sub-grade within SRZ/TPZ. Encroachment to TPZ = 42%.	Extent of encroachment to TPZ exceeds acceptable limits under AS 4970:2009. Proposed works are likely to result in a significant adverse impact. Proposed to be retained.	Retain in accordance with recommended Tree Protection Measures (Section 10). Undertake all excavations for the pavement sub-grade in accordance with Section 10.6.
21	***Callistemon viminalis*** (Weeping Bottlebrush)	M	2.5	1.5	19.6	Proposed asphalt pavement (car park) and K&G offset 0.4 metres north-west. Excavations for pavement sub-grade within SRZ/TPZ. Encroachment to TPZ = 38%	Extent of encroachment to TPZ exceeds acceptable limits under AS4970:2009. Excavations for pavement sub-grade and K&G footings for road are likely to result an adverse impact.	Remove tree.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
22	***Callistemon viminalis*** (Weeping Bottlebrush)	M	3.0	1.8	28.3	Proposed asphalt pavement (car park) and K&G offset 0.4 metres north-west. Excavations for pavement sub-grade within SRZ/TPZ. Encroachment to TPZ = 38%	Extent of encroachment to TPZ exceeds acceptable limits under AS4970:2009. Excavations for pavement sub-grade and K&G footings for road are likely to result an adverse impact.	Remove tree.
23	***Callistemon viminalis*** (Weeping Bottlebrush)	M	2.9	1.8	26.0	Located within footprint of proposed new car park and associated kerb and gutter.	Proposed works will necessitate removal.	Remove tree.
24	***Callistemon viminalis*** (Weeping Bottlebrush)	M	3.0	1.3	28.3	Located within footprint of proposed new car park and associated kerb and gutter.	Proposed works will necessitate removal.	Remove tree.
25	***Melaleuca styphelioides*** (Prickly Paperbark)	M	3.8	2.1	46.3	Located within footprint of proposed new car park and associated kerb and gutter.	Proposed works will necessitate removal.	Remove tree.
26	***Callistemon viminalis*** (Weeping Bottlebrush)	M	2.9	1.8	26.0	Proposed asphalt pavement (car park) and K&G offset 0.7 metres north-east. Excavations for pavement sub-grade within SRZ/TPZ. Encroachment to TPZ = 22%	Extent of encroachment to TPZ exceeds acceptable limits under AS4970:2009. Excavations for pavement sub-grade and K&G footings for road are likely to result an adverse impact.	Remove tree.
27	***Cupressus sempervirens* 'Stricta'** (Italian Cypress)	M	4.5	1.4	63.6	Located within footprint of proposed new car park and associated kerb and gutter.	Proposed works will necessitate removal.	Remove tree.
28	***Jacaranda mimosifolia*** (Jacaranda)	M	3.6	2.0	40.7	Proposed asphalt pavement (car park) and K&G offset 1.3 metres north-east. Excavations for pavement sub-grade within SRZ/TPZ. Encroachment to TPZ = 26%	Extent of encroachment to TPZ exceeds acceptable limits under AS4970:2009. Excavations for pavement sub-grade and K&G footings for road are likely to result an adverse impact.	Remove tree.
29	***Jacaranda mimosifolia*** (Jacaranda)	M	3.0	1.5	28.3	Located within footprint of proposed new car park and associated kerb and gutter.	Proposed works will necessitate removal.	Remove tree.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
30	***Jacaranda mimosifolia*** (Jacaranda)	M	6.0	2.5	113.0	Proposed porous pavement (car park bays 82-85) and K&G offset 0.8 metres north and 0.6 metres east. Excavations for pavement sub-grade within SRZ/TPZ (partially within footprint of existing road and partially within footprint of soft landscape areas). Encroachment to TPZ = 41%. Proposed 300mm diameter stormwater pipeline offset 3 metres north at IL? (assumed 500-1000mm below grade). Open trenching for pipeline within TPZ (within footprint of existing road pavement).	Extent of encroachment to TPZ exceeds acceptable limits under AS4970:2009. Excavations for pavement sub-grade and K&G footings for road are likely to result a significant adverse impact. Consideration has been given to relocating the K& G further away form the tree and eliminating some parking bays. However, this was not considered feasible by Council.	Retain in accordance with recommended Tree Protection Measures (Section 10). nstall tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6. Consider eliminating adjacent 2 carparking spaces (Bays 83 & 84) in order to minimise adverse impact on this tree. Undertake all open trenching within TPZ in accordance with Section 10.7.
31	***Jacaranda mimosifolia*** (Jacaranda)	M	5.5	2.4	96.4	Located within footprint of proposed new driveway crossover.	Proposed works will necessitate removal. Consideration has been given to eliminating the proposed entry exit driveway and retaining the existing driveway in the present position to permit the retention of this tree and the integrity of the row. However, this was not considered feasible by Council.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
32	***Jacaranda mimosifolia*** (Jacaranda)	M	6.6	2.6	136.8	Existing asphalt pavement and K&G offset 2.0 metres north-east to be demolished within SRZ/TPZ. Proposed asphalt pavement (car park) and K&G offset 2.0 metres north-east in same position. Excavations for pavement sub-grade within SRZ/TPZ. No increase to present encroachment.	No adverse impact provided that all demolition works within the TPZ are undertaken as recommended.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

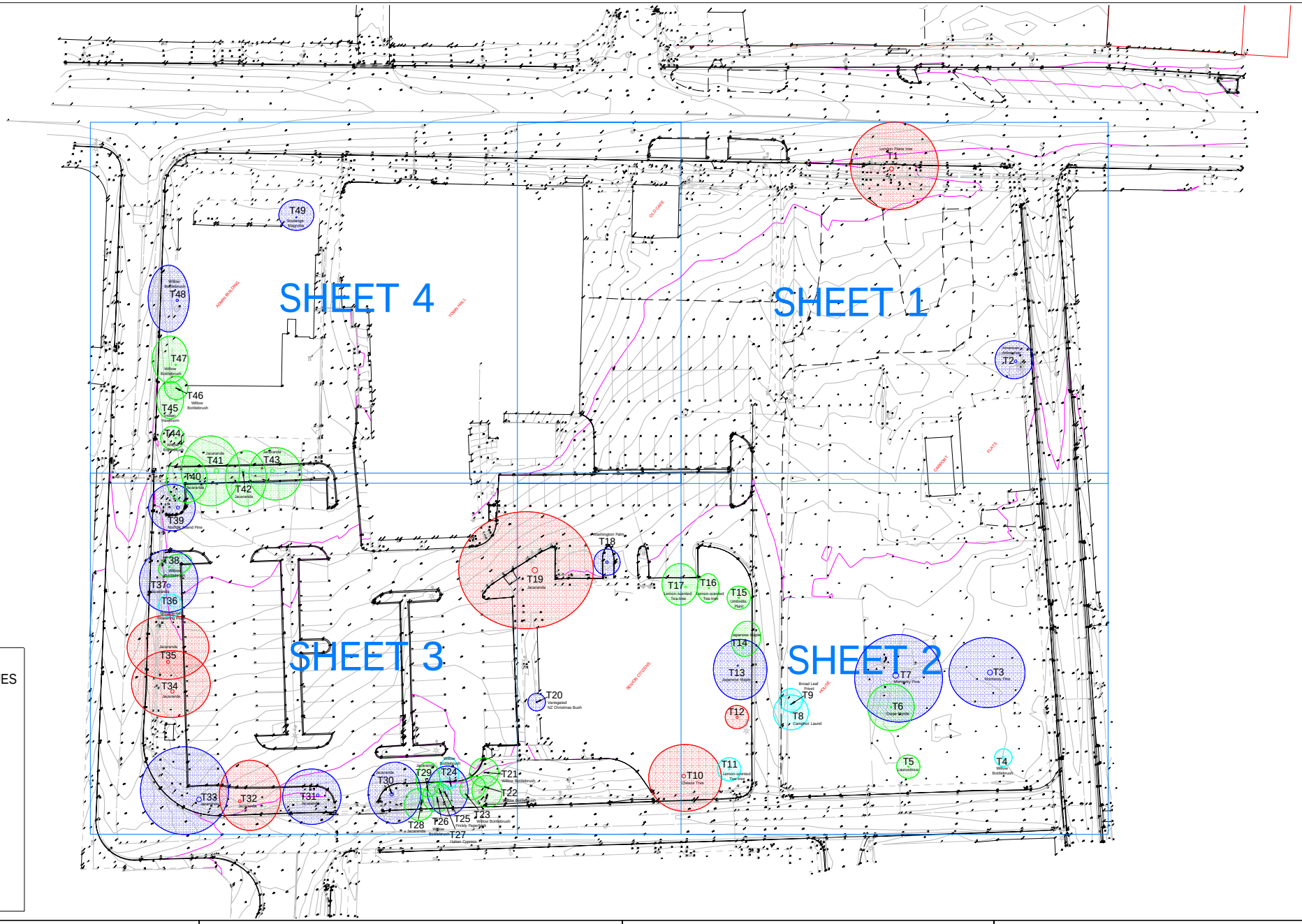
Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
33	***Jacaranda mimosifolia*** (Jacaranda)	M	9.0	2.9	254.3	Existing asphalt pavement and K&G offset 2.2 metres north-east to be demolished within SRZ/TPZ. Proposed asphalt pavement (car park) and K&G offset 3.7 metres east to 6.9 metres north-east. Excavations for pavement sub-grade within SRZ/TPZ. Decrease in present encroachment.	No adverse impact provided that all demolition works within the TPZ are undertaken as recommended.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6
34	***Jacaranda mimosifolia*** (Jacaranda)	M	6.8	2.6	146.9	Existing asphalt pavement and K&G offset 1.9 metres south-east to be demolished within SRZ/TPZ. Proposed asphalt pavement (car park) and K&G offset 3.5 metres south-east. Excavations for pavement sub-grade within SRZ/TPZ. Decrease in present encroachment.	No adverse impact provided that all demolition works within the TPZ are undertaken as recommended.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6
35	***Jacaranda mimosifolia*** (Jacaranda)	M	6.5	2.6	134.1	Existing asphalt pavement and K&G offset 2.6 metres south-east to be demolished within SRZ/TPZ. Proposed asphalt pavement (car park) and K&G offset 4.4 metres south-east. Excavations for pavement sub-grade within SRZ/TPZ. Decrease in present encroachment.	No adverse impact provided that all demolition works within the TPZ are undertaken as recommended.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6
36	***Prunus cerasifera* 'Nigra'** (Ornamental Flowering Plum)	M	2.4	1.7	18.1	Proposed new pedestrian pathway offset 1.5 metres north-east at RL? (assumed close to existing grade). Encroachment to TPZ = 11%.	No adverse impact. Proposed to be removed to accommodate new landscape works.	Remove tree.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
37	***Jacaranda mimosifolia*** (Jacaranda)	M	6.0	2.5	113.0	Located within footprint of proposed new pedestrian pathway.	Proposed works will necessitate removal. Consideration has been given to eliminating the proposed entry exit driveway and path and retaining the existing driveway in the present position to permit the retention of this tree and the integrity of the row. However, this was not considered feasible by Council.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
38	***Callistemon viminalis*** (Weeping Bottlebrush)	M	2.9	1.8	26.0	Located within footprint of proposed new driveway crossover.	Proposed works will necessitate removal.	Remove tree.
39	***Araucaria heterophylla*** (Norfolk Island Pine)	M	6.4	2.5	129.4	Existing asphalt pavement and K&G offset 0.9 metres south to be demolished within SRZ/TPZ. Proposed asphalt pavement (car park) and K&G offset 1.1 metres south (within present alignment and beyond existing kerb). Excavations for pavement sub-grade within SRZ/TPZ. Decrease in present encroachment.	No adverse impact provided that all demolition works within the TPZ are undertaken as recommended.	Retain in accordance with recommended Tree Protection Measures (Section 10). Install tree protection fencing in accordance with Section 10.3. Demolish the existing asphalt pavement in accordance with Section 10.5. Undertake all excavations for the pavement sub-grade within the TPZ in accordance with Section 10.6
40	***Jacaranda mimosifolia*** (Jacaranda)	M	4.5	2.2	62.8	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
41	***Jacaranda mimosifolia*** (Jacaranda)	M	9.4	3.0	279.8	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
42	***Jacaranda mimosifolia*** (Jacaranda)	M	6.0	2.5	113.0	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
43	***Jacaranda mimosifolia*** (Jacaranda)	M	7.8	2.8	189.0	Located within footprint of proposed new car parking area.	Proposed works will necessitate removal.	Remove tree.
44	***Callistemon viminalis*** (Weeping Bottlebrush)	M	2.0	1.5	12.6	Located within new small landscape island.	Proposed works will necessitate removal.	Remove tree.
45	***Raphiolepis indica*** (Indian Hawthorn)	M	3.6	2.0	40.7	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
46	***Callistemon viminalis*** (Weeping Bottlebrush)	M	2.0	1.5	12.6	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
47	***Callistemon viminalis*** (Weeping Bottlebrush)	M	3.6	2.0	40.7	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
48	***Callistemon viminalis*** (Weeping Bottlebrush)	M	6.0	2.5	113.0	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.
49	***Magnolia soulangeana*** (Magnolia)	M	3.2	1.6	32.2	No proposed works within TPZ.	No adverse impact.	To be retained - no special tree protection measures required.



LEGEND
TREE RETENTION VALUES

- HIGH
- MODERATE
- LOW
- VERY LOW

APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

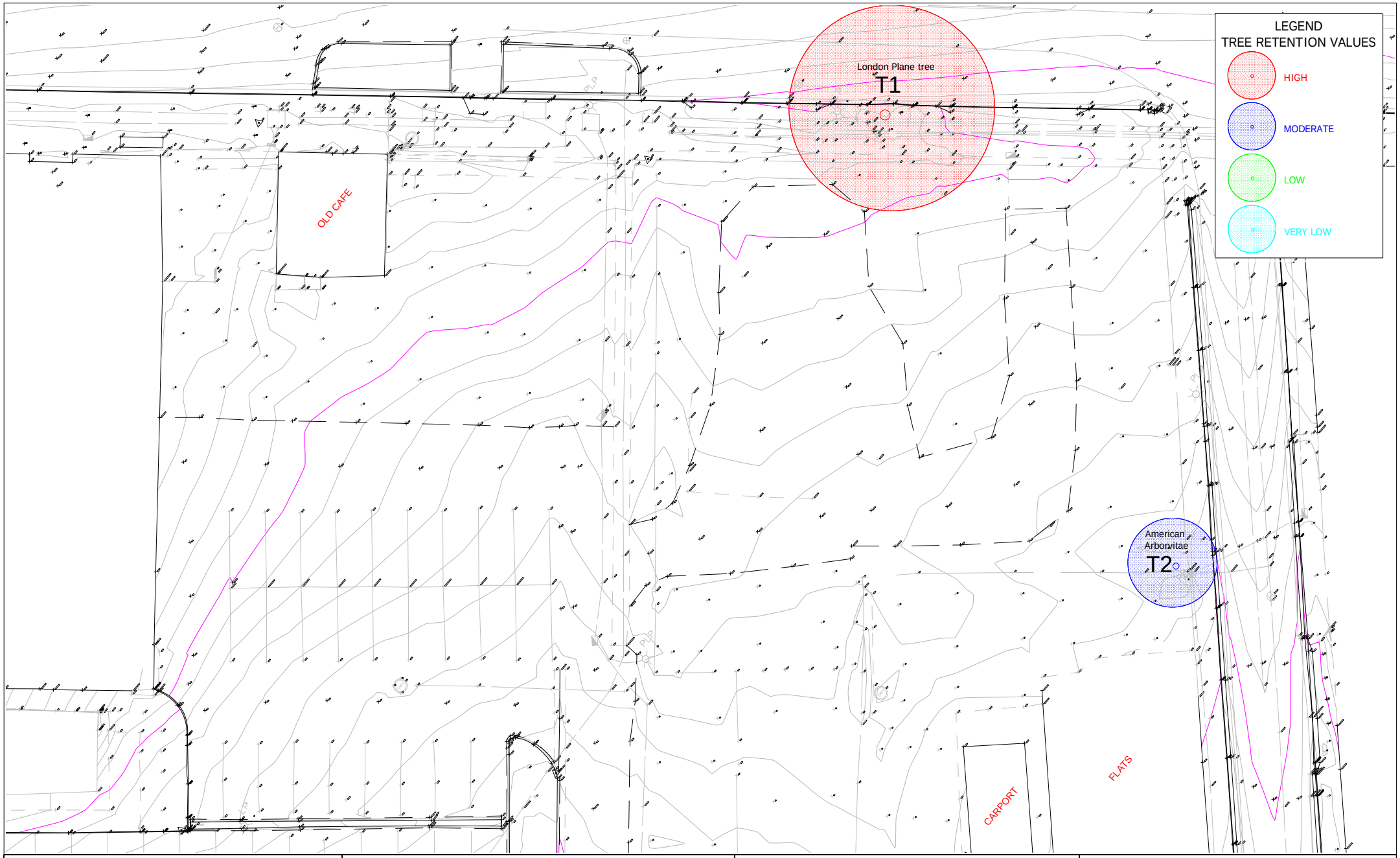
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120701 [A]

KEY PLAN

DATE: 07/12/2018



APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

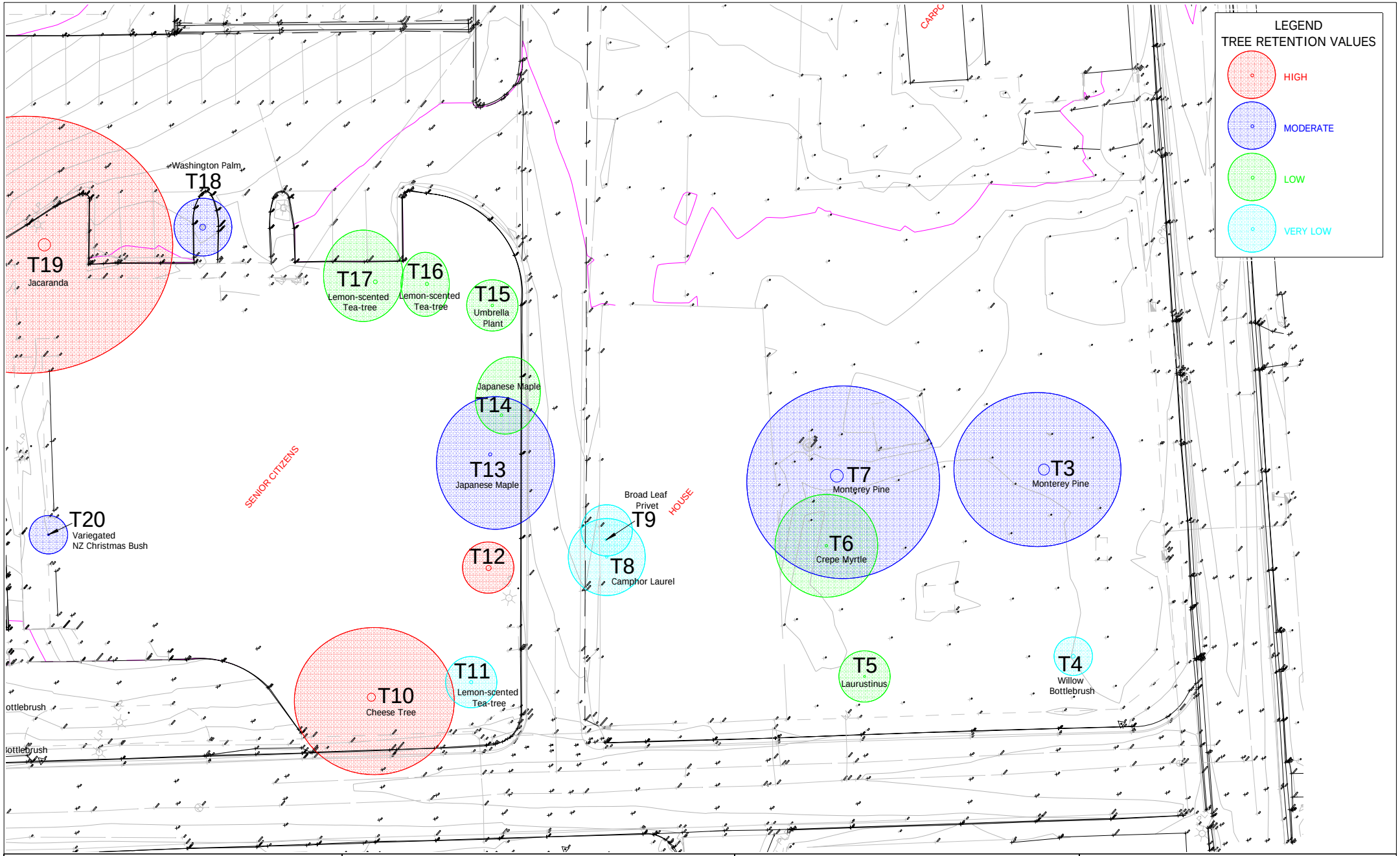
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120701 [A]

SHEET 1

DATE: 07/12/2018



APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

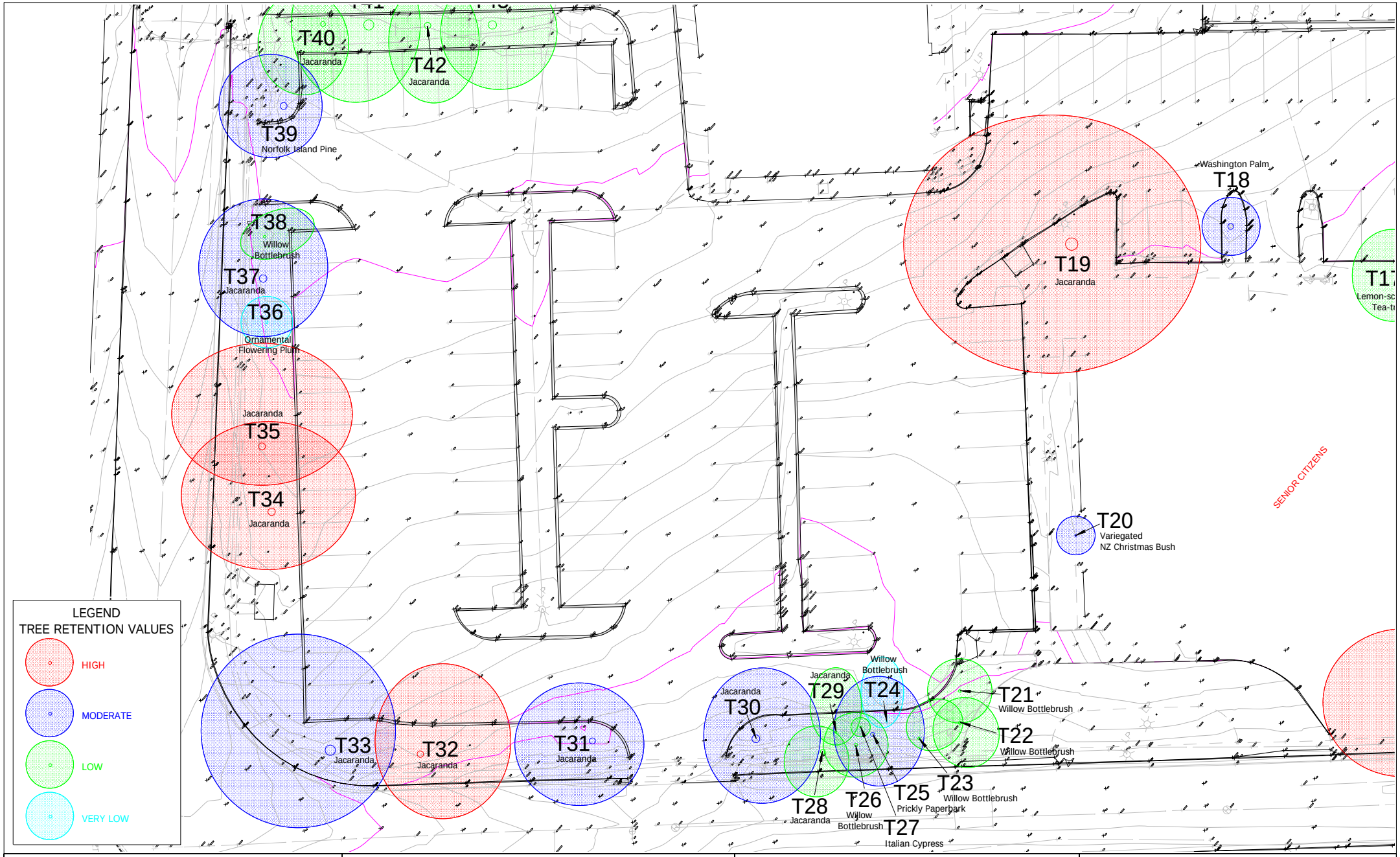
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120701 [A]

SHEET 2

DATE: 07/12/2018



APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

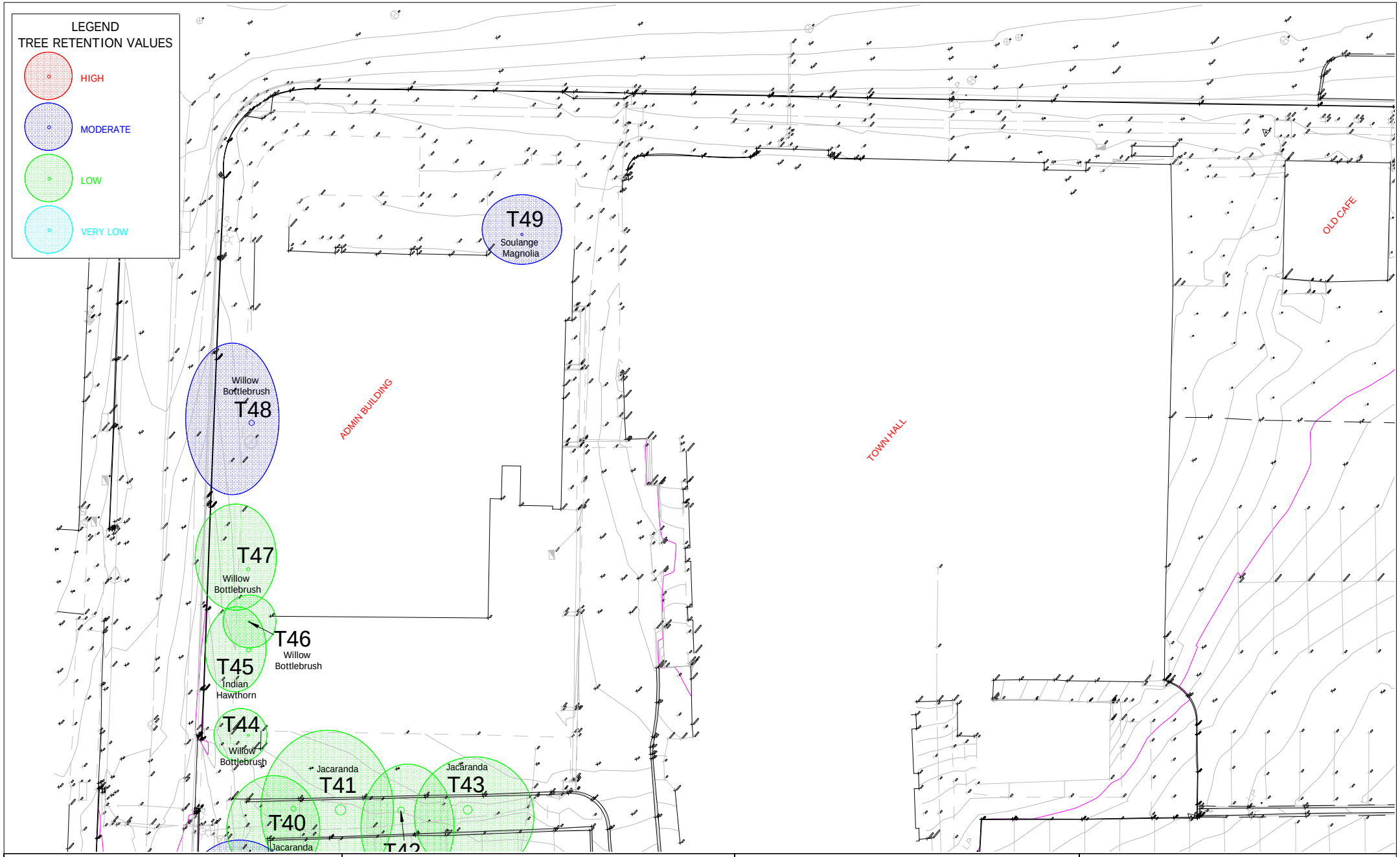
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120701 [A]

SHEET 3

DATE: 07/12/2018



APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

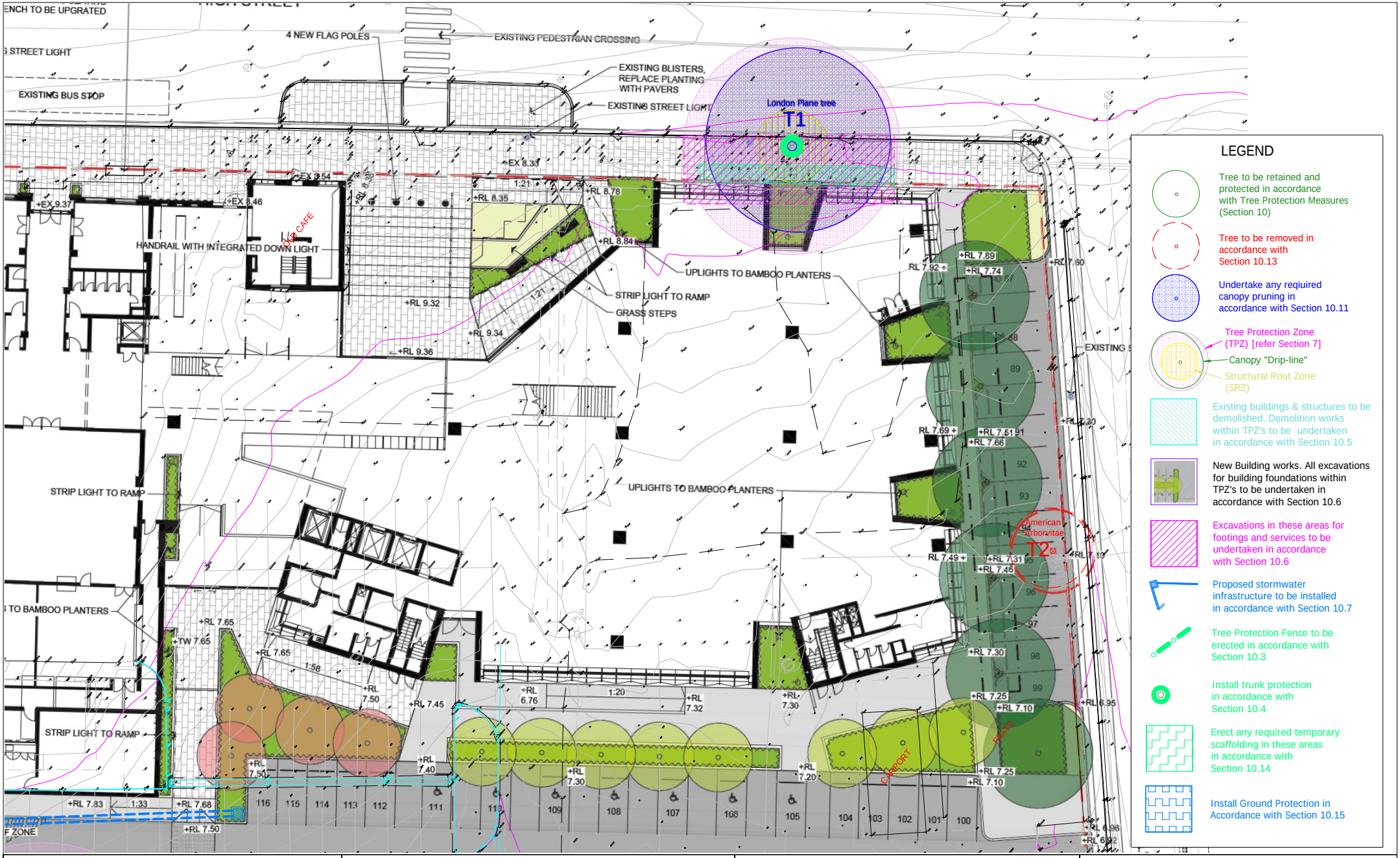
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120701 [A]

SHEET 4

DATE: 07/12/2018



APPENDIX 6

TREE PROTECTION PLAN

Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120702 [C]

SHEET 1

DATE: 02/04/2019

APPENDIX 6

TREE PROTECTION PLAN

Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

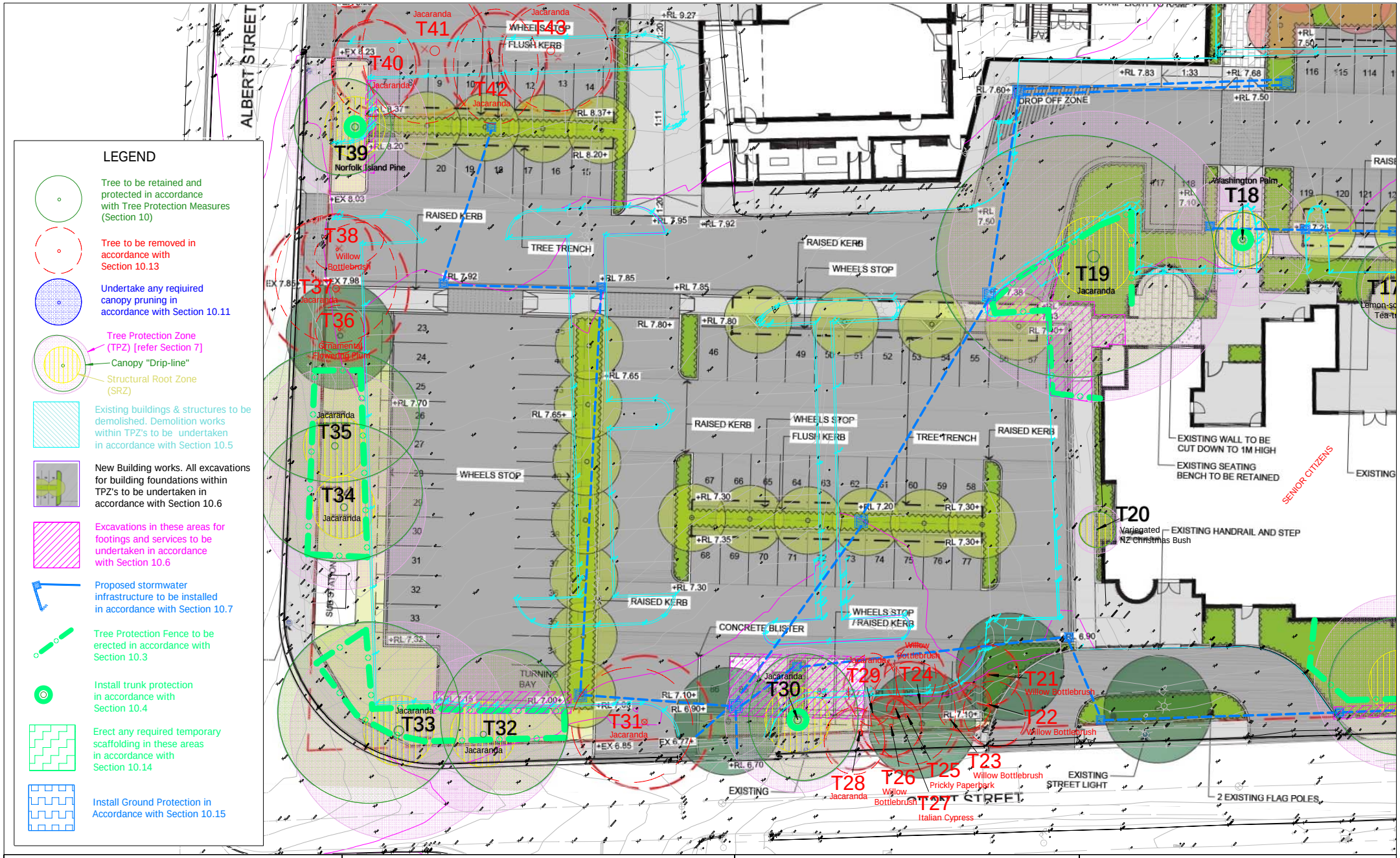
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120702 [C]

SHEET 2

DATE: 02/04/2019



APPENDIX 6

TREE PROTECTION PLAN

Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

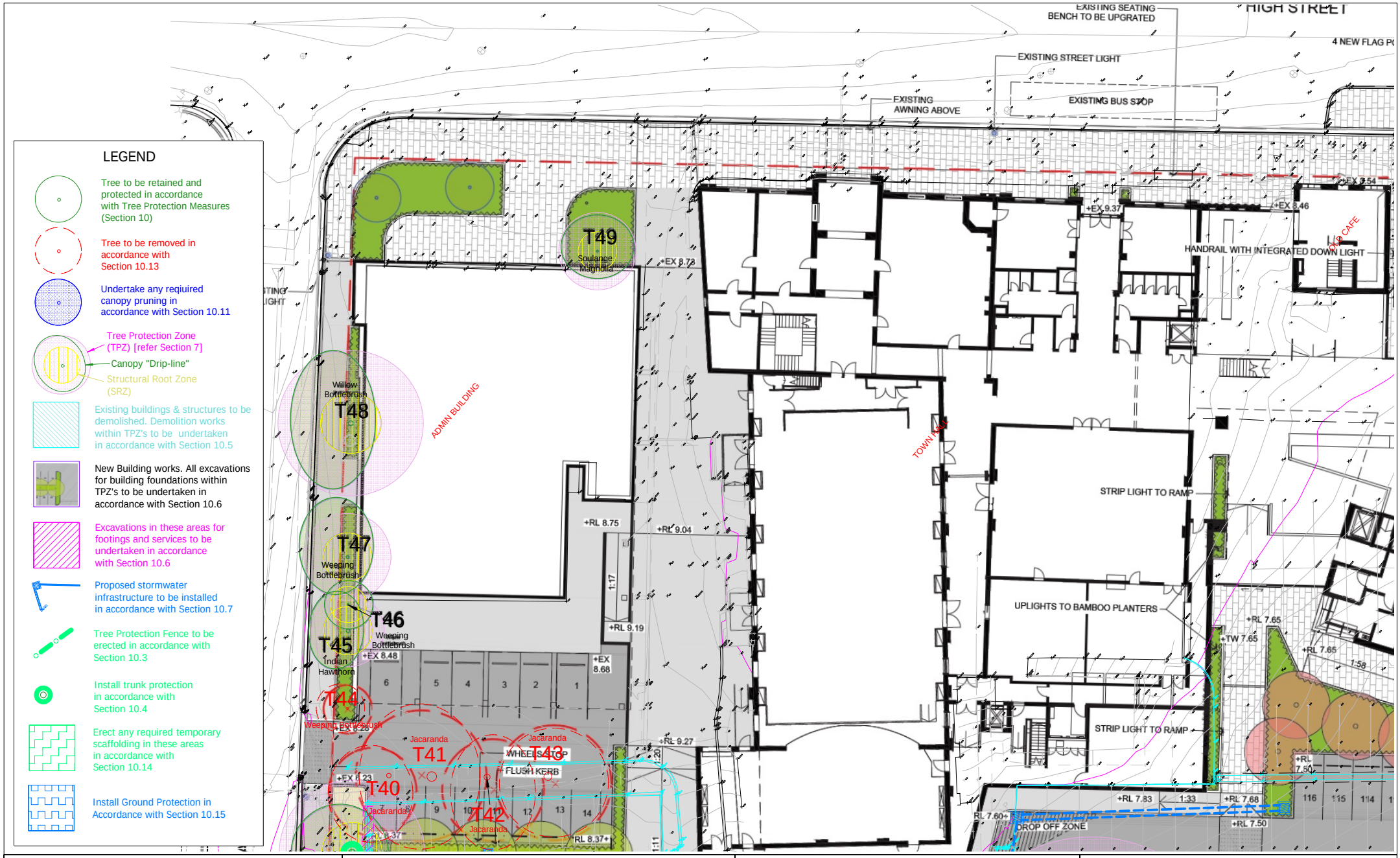
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120702 [C]

SHEET 3

DATE: 02/04/2019



APPENDIX 6

TREE PROTECTION PLAN

Maitland Town Hall & City Administration
279-287 High Street, MAITLAND, NSW

Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Maitland City Council
Dwg Ref No.
Dated May 2018

DWG No. T18-120702 [C]

SHEET 4

DATE: 02/04/2019