EARTHSCAPE HORTICULTURAL SERVICES
Arboricultural, Horticultural and Landscape Consultants

ABN 36 082 126 027

ARBORICULTURAL IMPACT ASSESSMENT REPORT

PROPOSED MASTER PLAN DEVELOPMENT

WICKHAM WOOLSTORE
33-57 ANNIE STREET WICKHAM

August 2018

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TABLE OF CONTENTS

1 INTRODUCTION

1.1.1 This report was commissioned by Investec Australia Finance Limited to assess the health and condition of eighteen (18) trees located within or immediately adjacent to the former Wickham Wool Store buildings located at 33-57 Annie Street, Wickham NSW. The report has been prepared to aid in the assessment of a Development Application (DA) for a Master Plan Development of the site.

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 Newcastle City Council's guidelines for preparation of Arborists Reports as outlined in Part A, Section 6 of Council's *Urban Forest Technical Manual* (July 2011) and Sections 2.3.2-2.3.5 of the Australian Standard for *Protection of Trees on Development Sites* (AS 4970:2009).

2 THE SITE

2.1.1 The subject property consists of several industrial allotments including Lots 1, 2 & 3 in DP 346352 and Lot 13 in DP 830026, being the former Wickham Wool Stores, 33-57 Annie Street, Wickham. For the purposes of this report, the subject allotments will be referred to as 'the site'. The total area of the site is approximately 31,276 m² (3.12 hectares). The site is zoned Light Industrial [IN2] under the *Newcastle Local Environmental Plan 2012* (NLEP). The site contains several large warehouse buildings (former Wool Stores) and large hardstand areas currently used as a self-storage facility (known as Wickham Self Storage). The site is relatively flat and the majority of the site is built upon aside from the south-eastern corner of the site, which contains a level grassed area and several mature trees. A number of small trees also stand around the periphery of the site within the adjacent road reserves of The Avenue and Milford Street. These include a variety of non-local native species.

2.1.2 Soils of this area have been extensively disturbed and modified for industrial and urban development. The original soils of this area are typical of the Hamilton Soil Landscape Group (as classified in the *Soil Landscapes of the Newcastle 1:100,000 Sheet*), consisting of "deep (greater than 1500 mm) well-drained weak *Podzols* with some deep (greater than 1000mm) well drained *Brown Podzolic Soils*."[1] The soils are derived from Quaternary sand (alluvium) overlying clay deposits. The landscape of this area is generally level to gently undulating plains with level to gently inclined slopes of less than 2% grade.

3 SUBJECT TREES

3.1.1 The subject trees were inspected by Earthscape Horticultural Services (EHS) on the 29th June 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 Monteath & Powys Pty Ltd, Dwg. Ref No. 150323d [3] dated 10/04/2018. The numbers used on this plan correlate with the Tree Assessment Schedule (**Appendix 3**). Tree No.s T1a, T16 & T17 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

Declared Vegetation within the City of Newcastle Local Government Area (LGA) is protected under Section 5.03 (Vegetation Management) of the *Newcastle Development Control Plan 2012* (NDCP), made pursuant to Clause 9 of the *State Environmental Planning Policy (Vegetation in Non-rural Areas) 2017* (SEPP VNRA). The NDCP generally protects all trees of a height of three (3) metres or greater or with a trunk circumference of 450mm or greater (140mm in diameter); all trees and shrubs located on land managed by a public authority (including Newcastle City Council) regardless of size; any vegetation that is, or forms part of, a Heritage Item; all vegetation listed as a Threatened or Vulnerable Species and any vegetation forming part of an Endangered Ecological Community (EEC). Some exemptions apply. However, all of the subject trees are protected under the provisions of the NDCP 2012.

5.2.2 Wildlife Habitat

All of the trees are planted 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 or other visible signs of wildlife habitation.

5.2.3 Noxious Plants & Environmental Weeds

None of the subject trees are scheduled as a potential 'Biosecurity Risk' ('Priority Weed' – formerly 'Noxious Weed') within the Newcastle LGA under the provisions of the *Biosecurity Act 2015.*

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 *Threatened Species Conservation Act 1995* (NSW) or the *Environment Protection and Biodiversity Conservation Act 1999*.

5.3 Heritage Significance

5.3.1 Heritage Items

The subject property is listed as an item of Environmental Heritage [Items 678, 679 & 680] under Schedule 5, Part 1 of the *Newcastle Local Environmental Plan 2012* (NLEP).

Item 678 (33 Annie Street) is described as the former New Zealand Loan Company Wool Store, Item 679 (49 Annie Street) the former Dalgety Warehouse and Item 670 (57 Annie Street) the former Elders Warehouse. These include three substantial five storey warehouse buildings of similar size and age all built within the site in the early 1940's as Wool storage and handling facilities. The buildings are essentially the same design, albeit with slightly different facades. The buildings are described as 'Inter-War Stripped Classical' style, all constructed by Stuart Bros. Pty Ltd for three major woolselling brokers. The Wool Stores were a key element in the development of Newcastle as a major wool handling and export centre through the mid-20th Century.[4]

5.3.2 Heritage Conservation Area

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

5.3.3 Significant Tree Register

Newcastle City Council does *not* currently maintain a Register of Significant Trees.

5.3.4 General

All of the street trees within the road reserves of The Avenue and Milford Street are of similar vintage and were probably planted post-1990. Trees T1 & T3 (Bangalay) and T2 (Swamp Mahogany) appear to be earlier plantings, perhaps dating back to 1970-1980, but are unlikely to have been planted contemporary with the development of the Wool Stores. None of the subject trees have any known or suspected heritage significance.

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 One**. 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							

TABLE 2 – TREE RETENTION PRIORITES.

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

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.

7.5 Legal Protection

7.5.1 Notwithstanding the above recommendations, Council may require a greater setback from certain types of structures to ensure the on-going legal protection of the tree (i.e. its legal status under Council's Tree Management Controls). In the Newcastle LGA, a tree located within three (3) metres of the wall of a dwelling or approved 'principal' building is not protected under the NDCP 2012. The measurement is taken from the closest point on the trunk of the tree to the footings of the building. As such, if a tree is considered worthy of preservation, Council is unlikely to approve

the construction of a building within three (3) metres of the tree (regardless of whether this can be undertaken without having an adverse impact on its health or longevity).

8 PROPOSED DEVELOPMENT

8.1.1 The proposed development includes the Master Plan development of the property for a Mixed Use Development including residential, commercial and retail spaces. The Master Plan generally proposes retention of the three existing wool store buildings for restoration and adaptive re-use, construction of two new similar sized buildings (Buildings 4 & 5), construction of a new internal road link and pedestrian thoroughfares and construction of a new park, together with associated landscape works.

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
Landscape Plan	James Mather Delaney Design	L08 [A]	05/06/2017

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 eleven (11) trees of low retention value. These include Tree No.s T1a (Tuckeroo), T2 (Swamp Mahogany), T4 & T7 (Broad-leaved Paperbark), T5, T8, T9, T10 & T11 (Weeping Bottlebrush) and T14 & T16 (Lillypilly). 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. It should be noted that Trees T4, T5, T7, T8, T9, T10, T11, T15 & T16 are located on Council's nature strip. These trees should be replaced with an equivalent number of new trees elsewhere on the nature strip in accordance with **Section 10**.

9.1.4 The proposed development will also necessitate the removal of six (6) trees of moderate retention value. These include Tree No.s T1 (Bangalay), T6 (Broadleaved Paperbark), T12 & T13 (Weeping Bottlebrush) and T14 & T17 (Lillypilly). These trees are not considered significant, but are in good health and fair 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 elsewhere within the site in accordance with **Section 10**. It should be noted that Trees T6, T12, T13, T14 & T17 are located on Council's nature strip. These trees should be replaced with an equivalent number of new trees elsewhere on the nature strip in accordance with **Section 10**.

9.1.1 The proposed development will also necessitate the removal of one (1) tree of high retention value, being T3 (Bangalay). This tree has no special ecological or heritage significance, but is in good health and condition and makes a positive contribution to the amenity of the site and surrounding properties. In order to retain this tree, substantial redesign of the proposed development would be required to accommodate the tree given the size of the tree and the TPZ. This would include reduction on the size of Building 4 and amendment to the proposed vehicular circulation. Re-design of the development to accommodate this tree is therefore not considered feasible in this instance. In order to compensate for loss of amenity resulting from the removal of this tree to accommodate the proposed development, consideration should be given to replacement planting elsewhere within the site in accordance with **Section 10**.

10 REPLACEMENT PLANTING

10.1.1 In accordance with Section 5.03.04 B.1. of the NDCP 2012, where it is proposed to remove up to three (3) trees, compensatory planting should be undertaken within the site in accordance with Councils *Urban Forest Policy*. Requirements for compensatory planting are also detailed in Section 4.3 of Council's *Urban Forest Technical Manual 2018*. Where a tree of Moderate or High Retention Value cannot be retained in the context of any proposed development, compensatory planting with new trees is required. The number of trees to be planted is based on the total area of crown projection of the trees to be removed, as indicated in the following table:-

Table 4 - A guide to compensatory planting on the development site

	Total area of crown projection to be removed#	**Number of standard trees* to be planted**
1	Up to 20 m²	1 x standard tree
2	21 m² – 40 m²	2 x standard trees
3	41 m² - 60 m²	3 x standard trees
4	61 m² - 80 m²	4 x standard trees
5	81 m² -100 m²	5 x standard trees

Note 1: Crown Projection (m²) = average canopy radius² x π

* **Note 2**: A standard tree is a minimum 45 Litre container volume, a minimum crown projection at maturity of 20m² and of a desirable species.

10.1.2 The total area of the crown projection to be removed of moderate and high retention value trees within the site (T1, T1a, T2 & T3) is estimated at approximately 553 m². As such, in order to compensate for loss of amenity resulting from the removal of trees to accommodate the proposed development, a minimum number of twenty-eight (28) new 'standard' trees (capable of attaining a height of at least ten (10) metres and six (6) metres crown spread at maturity) of suitable species should be planted within appropriate areas of the site.

10.1.3 The following species are considered suitable to the site conditions and could be used for replacement planting:-

- *Acmena smithii* (Lillypilly)
- *Ficus rubiginosa* (Port Jackson Fig)
- *Sysygium paniculatum* (Magenta Cherry)
- *Ulmus parvifolia* (Chinese Elm)
- *Magnolia grandiflora* (Bullbay Magnolia)

- *Cupaniopsis anarcardioides* (Tuckeroo)
- *Glochidion ferdinandi* (Cheese Tree)
- *Corymbia maculata* (Spotted Gum)
- *Angophora floribunda* (Rough-barked Apple)
- *Tristaniopsis laurina* (Water Gum)
- *Melaleuca leucadendra* (Cajuput)
- *Angophora costata* (Sydney Red Gum)
- *Lophostemon confertus* (Brushbox)

10.1.4 In order to compensate for loss of amenity resulting from the removal of the trees within the road reserve, an equivalent number [fourteen (14] new trees should be planted elsewhere within the nature strip in accordance with the *Newcastle Street Tree Masterplan* (September 2011). Based on Council's Species Selection Process and Species Matrix, the following constraints have been identified:-

	Nature Strip Width [Code]	**Overhead Powerlines**	**Building Setback**
The Avenue	3.2 metres [F2]	No	> 6 metres
Milford Street	3.4 metres [F2]	Yes	< 1 metre
Annie Street	3.6 metres [F3]	Yes	< 1 metre

10.1.5 Soils are expected to be disturbed alluvium (coarse loamy sand and silt) with good drainage (refer Section 2.1.2). Based on the species matrix the following species are considered suitable to the site conditions and could be used for replacement planting:-

The Avenue

- *Banksia integrifolia* (Coast Banksia)
- *Cupaniopsis anarcardioides* (Tuckeroo)
- *Fraxinus griffithii* (Evergreen Ash)
- *Tristaniopsis laurina* (Water Gum)
- *Tristaniopsis laurina* 'Luscious' (Water Gum)
- *Pistacia chinensis* (Chinese Pistachio)
- *Magnolia grandiflora* 'Little Gem' (Little Gem Magnolia)
- *Hibiscus tiliaceus* (Coast Hibiscus)
- *Koelreuteria paniculata* (Golden Rain Tree)

Milford Street

- *Cupaniopsis anarcardioides* (Tuckeroo)
- *Fraxinus griffithii* (Evergreen Ash)
- *Tristaniopsis laurina* (Water Gum)
- *Tristaniopsis laurina* 'Luscious' (Water Gum)
- *Pistacia chinensis* (Chinese Pistachio)
- *Hibiscus tiliaceus* (Coast Hibiscus)
- *Koelreuteria paniculata* (Golden Rain Tree)
- *Lagerstroemia indica 'Bilox'* (Crepe Myrtle)

Annie Street

- *Backhousea anisata* (Aniseed Tree)
- *Alectryon tomentosus* (Woolly Rambutan)

- *Glochidion ferdinandi* (Cheese Tree)
- *Harpulia pendula* (Tulipwood)

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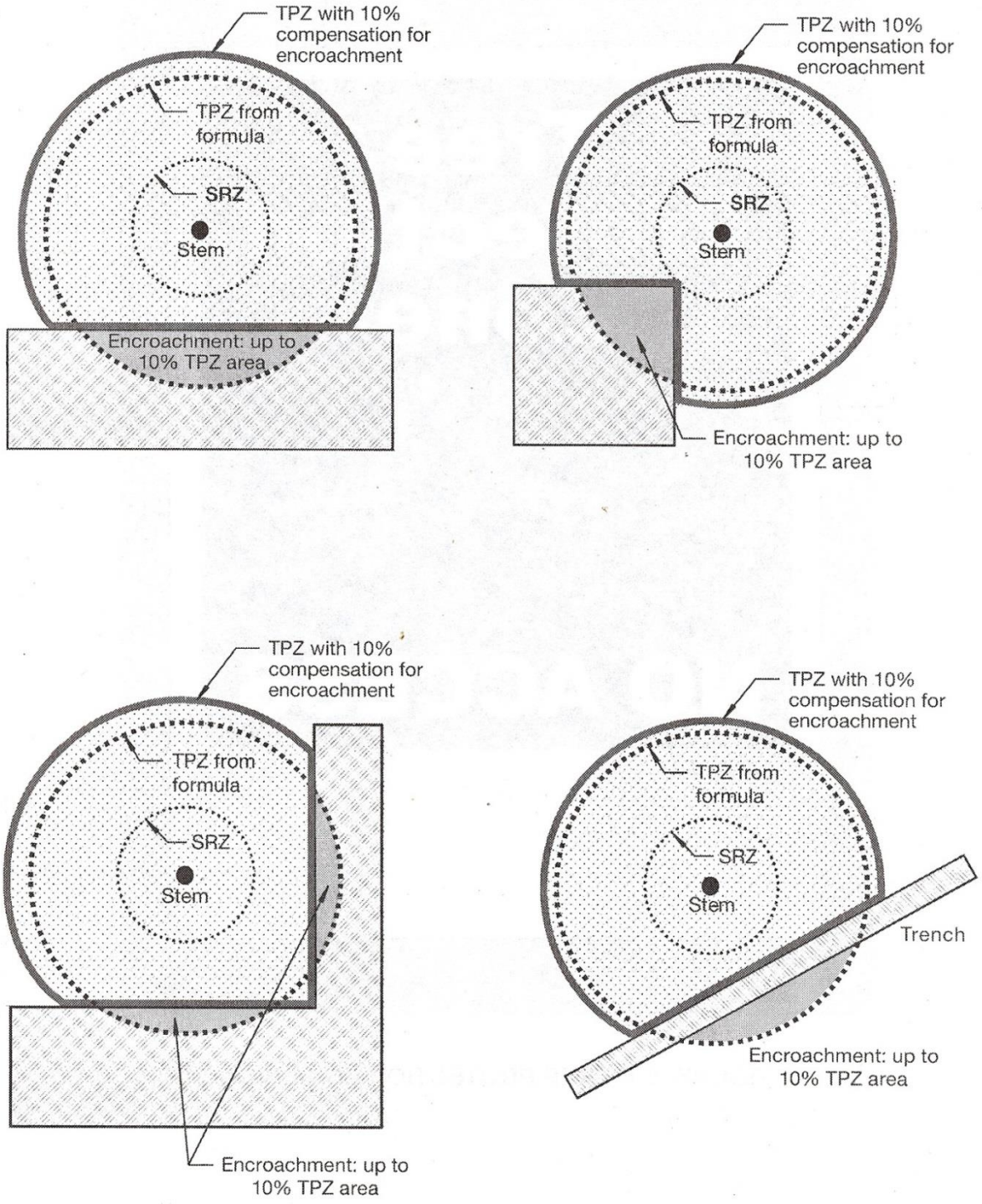
APPENDIX 1 - CRITERIA FOR ASSESSMENT OF LANDSCAPE SIGNIFICANCE

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

REFERENCES:-

[1] Matthei, L.E. (1995)
Soil Landscapes of the Sydney 1:100,000 Sheet Report
Department of Land and Water Conservation, Sydney

[2] Mattheck, Dr. Claus & Breloer, Helge (1994) – Sixth Edition (2001)
The Body Language of Trees – A Handbook for Failure Analysis
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[3] Barrell, Jeremy (1996)
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[4] Office of Environment and Heritage (June 2005)
NSW State Heritage Register (database) – New Zealand Loan Co. Wool Store (Former)
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[5] Council of Standards Australia (August 2009)
AS 4970 – 2009 – Protection of Trees on Development Sites
Standards Australia, Sydney

APPENDIX 3 - TREE HEALTH AND CONDITION ASSESSMENT SCHEDULE

Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm) at 1.4 metres	Live Crown Size (m^2)	Maturity Class	Condition	Previous Pruning	Health		Remaining Safe Useful Life Expectancy (SULE)	Landscape Significance Rating	Retention Value	Location
									Vigour	Pest & Disease				
1	***Eucalyptus botryoides*** (Bangalay)	18	18	1200	270	M	Appears stable with fair branching structure. Exhibits multiple co-dominant limbs at 2-3 metres. Moderate axial wound at 8 - 10 metres with adaptive growth and suspected decay due suspected previous lightning strike. Moderate occluded axial wound from GL to 1.5 metres. Minor dieback with 5% deadwood and 25% epicormic growth.	Selectively pruned east side to clear building	Good	No Evidence	Medium 15-40 Years	3	**Moderate**	On-site
1A	***Cupaniopsis anarcardioides*** (Tuckeroo)	5	4	108	16	I	Appears stable with poor branching structure. Exhibits a high bark inclusion at 2 metres. Located close to existing building (< 1 metre).	No Evidence	Very Good	No Evidence	Short 5-15 Years	5	**Low**	On-site
2	***Eucalyptus robusta*** (Swamp Mahogany)	11	13	360	117	SM	Appears stable with fair branching structure. Upper crown suppressed & distorted due overshadowing. Minor dieback with 5% deadwood and 25% epicormic growth.	Selectively pruned (SLs lopped) east side to clear building	Fair	Low foliar insect infestation (Brown Lace Lerp)	Short 5-15 Years	4	**Low**	On-site
3	***Eucalyptus botryoides*** (Bangalay)	20	20	850	320	M	Appears stable with sound branching structure. Exhibits multiple small wounds (SL & TL branch stubs) due branch loss (storm damage).	Selectively pruned (SLs lopped) east side to clear building, south to clear powerlines	Very Good	No Evidence	Long - more than 40 years	3	**High**	On-site
4	***Melaleuca quinquenervia*** (Broad-leaved Paperbark)	4	5	366	15	M	Appears stable with fair branching structure. Exhibits multiple low bark inclusions at 2 metres at junctions of PLs. 30% epicormic growth due previous pruning.	PLs & SLs lopped to clear powerlines at 2-3 metres	Very Good	No Evidence	Medium 15-40 Years	5	**Low**	Nature strip
5	***Callistemon viminalis*** (Weeping Bottlebrush)	4	5	100x3	15	SM	Appears stable with fair branching structure. Exhibits multiple high bark inclusions at GL.	Crown lifted to 2 metres.	Fair with slightly thinning crown	No Evidence	Short 5-15 Years	5	**Low**	Nature strip
6	***Melaleuca quinquenervia*** (Broad-leaved Paperbark)	4.5	7	325	21	M	Appears stable with fair branching structure. 30% epicormic growth due previous pruning.	Crown lifted to 2 metres. SLs lopped to clear powerlines at 2-3 metres	Good	No Evidence	Long - more than 40 years	5	**Moderate**	Nature strip

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

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Tree Identification No.	Species	Height (m)	Spread (m)	Trunk Diameter (mm) at 1.4 metres	Live Crown Size (m^2)	Maturity Class	Condition	Previous Pruning	Health		Remaining Safe Useful Life Expectancy (SULE)	Landscape Significance Rating	Retention Value	Location
									Vigour	Pest & Disease				
7	***Melaleuca quinquenervia*** (Broad-leaved Paperbark)	5	5	248	17.5	SM	Stability suspect with fair branching structure. Prominent lean to the east. Minor dieback with 5% deadwood	Topped at 1 metre. TLs lopped to clear powerlines at 2-3 metres	Fair with slightly thinning crown	No Evidence	Medium 15-40 Years	5	**Low**	Nature strip
8	***Callistemon salignus*** (Willow Bottlebrush)	4.5	5	160 + 175	12.5	SM	Appears stable with fair branching structure. Exhibits multiple high bark inclusions at GL at junctions of co-dominant PLs. Severe bark inclusion at 1 metre at junction of PL.	PLs & SLs lopped to clear powerlines at 2-3 metres	Fair	High foliar insect infestation (Scale) with subs. Sooty Mould	Short 5-15 Years	5	**Low**	Nature strip
9	***Callistemon viminalis*** (Weeping Bottlebrush)	5	6	427	21	M	Appears stable with fair branching structure. Exhibits multiple high bark inclusions at 1.5 metres at junctions of PLs. 30% epicormic growth due previous pruning. Prominent lean to the south.	PLs & SLs lopped to clear powerlines at 2-3 metres	Good	No Evidence	Short 5-15 Years	5	**Low**	Nature strip
10	***Callistemon viminalis*** (Weeping Bottlebrush)	4	6	400	12	M	Appears stable with fair branching structure. Exhibits a large wound due branch loss at 2 metres (PL broken due vehicle damage). 30% epicormic growth due previous pruning. Multiple PLs at 1-2 metres.	PLs & SLs lopped to clear powerlines at 3 metres	Good	No Evidence	Short 5-15 Years	4	**Low**	Nature strip
11	***Callistemon viminalis*** (Weeping Bottlebrush)	4	5	350	12.5	M	Appears stable with fair branching structure. 30% epicormic growth due previous pruning	PLs & SLs lopped to clear powerlines at 3 metres	Good	No Evidence	Short 5-15 Years	4	**Low**	Nature strip
12	***Callistemon viminalis*** (Weeping Bottlebrush)	4.5	7	180x4 + 150x5	31.5	M	Appears stable with poor branching structure. 30% epicormic growth due previous pruning. Moderate bark inclusion at GL.	PLs & SLs lopped to clear powerlines at 2-3 metres	Good	No Evidence	Medium 15-40 Years	4	**Moderate**	Nature strip
13	***Callistemon viminalis*** (Weeping Bottlebrush)	4.5	9	200x2 + 180x3 + 150	22.5	M	Appears stable with fair branching structure. Exhibits multiple high bark inclusions at GL at junctions of co-dominant PLs. Prominent lean to the west. 30% epicormic growth due previous pruning	PLs & SLs lopped to clear powerlines at 2-3 metres	Good	No Evidence	Medium 15-40 Years	4	**Moderate**	Nature strip
14	***Syzygium australe*** (Lilly Pilly)	6	7	318	35	SM	Appears stable with sound branching structure. Exhibits multiple low bark inclusions at 1.8 metres	Crown lifted to 2 metres.	Good	No Evidence	Long - more than 40 years	4	**Moderate**	Nature strip

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) at 1.4 metres	Live Crown Size (m^2)	Maturity Class	Condition	Previous Pruning	Health		Remaining Safe Useful Life Expectancy (SULE)	Landscape Significance Rating	Retention Value	Location
									Vigour	Pest & Disease				
15	***Syzygium australe*** (Lilly Pilly)	6	4	220 + 150	20	SM	Appears stable with poor branching structure. Exhibits a severe bark inclusion at GL at junction of co-dominant leaders.	No Evidence	Good	No Evidence	Medium 15-40 Years	5	**Low**	Nature strip
16	***Syzygium australe*** (Lilly Pilly)	4	3	156	6	SM	Stability suspect with sound branching structure. Exhibits a very prominent lean to the north-east. Multiple basal epicormic sprouts.	Crown lifted to 2 metres.	Fair with thinning crown	High foliar insect infestation (Scale)	Short 5-15 Years	5	**Low**	Nature strip
17	***Syzygium australe*** (Lilly Pilly)	6	6	120x2 + 200	36	SM	Appears stable with fair branching structure. Exhibits a high bark inclusion at GL. Multiple basal epicormic sprouts.	No Evidence	Good	No Evidence	Long - more than 40 years	4	**Moderate**	Nature strip

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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	***Eucalyptus botryoides*** (Bangalay)	P	14.4	3.7	651.1	Located within footprint of proposed roadway.	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 10.
1A	***Cupaniopsis anarcardioides*** (Tuckeroo)	M	2.7	1.4	22.9	Located within footprint of proposed roadway.	Proposed works will necessitate removal	Remove tree.
2	***Eucalyptus robusta*** (Swamp Mahogany)	P	7.0	2.2	153.9	Located within footprint of proposed roadway.	Proposed works will necessitate removal	Remove tree.
3	***Eucalyptus botryoides*** (Bangalay)	P	10.2	3.2	326.7	Located within footprint of proposed roadway.	Proposed works will necessitate removal (high retention value). There are no feasible options that can be recommended that would permit the preservation of this tree without substantial redesign of the development.	Undertake replacement planting with a new tree elsewhere within the site to compensate for loss of amenity in accordance with Section 10.
4	***Melaleuca quinquenervia*** (Broad-leaved Paperbark)	M	4.4	2.2	60.6	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
5	***Callistemon viminalis*** (Weeping Bottlebrush)	M	3.0	1.8	28.3	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
6	***Melaleuca quinquenervia*** (Broad-leaved Paperbark)	M	3.9	2.2	47.7	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.

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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
7	***Melaleuca quinquenervia*** (Broad-leaved Paperbark)	M	3.0	1.9	27.9	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
8	***Callistemon salignus*** (Willow Bottlebrush)	M	3.0	2.0	28.3	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
9	***Callistemon viminalis*** (Weeping Bottlebrush)	M	5.1	2.3	82.3	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
10	***Callistemon viminalis*** (Weeping Bottlebrush)	M	4.8	2.4	72.3	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
11	***Callistemon viminalis*** (Weeping Bottlebrush)	M	4.2	2.2	55.4	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
12	***Callistemon viminalis*** (Weeping Bottlebrush)	M	5.2	2.4	83.6	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
13	***Callistemon viminalis*** (Weeping Bottlebrush)	M	6.6	2.7	136.8	Located within footprint of proposed asphalt pavement.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 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
14	***Syzygium australe*** (Lilly Pilly)	M	3.8	2.2	45.9	Located within footprint of proposed new footpath.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
15	***Syzygium australe*** (Lilly Pilly)	M	3.6	2.1	40.7	Located within footprint of proposed new footpath.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
16	***Syzygium australe*** (Lilly Pilly)	M	2.5	1.6	19.6	Located within footprint of proposed new footpath.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.
17	***Syzygium australe*** (Lilly Pilly)	M	3.6	2.1	40.7	Located within footprint of proposed new footpath.	Proposed works will necessitate removal	Undertake replacement planting with a new tree elsewhere within the road reserve to compensate for loss of amenity in accordance with Section 10.

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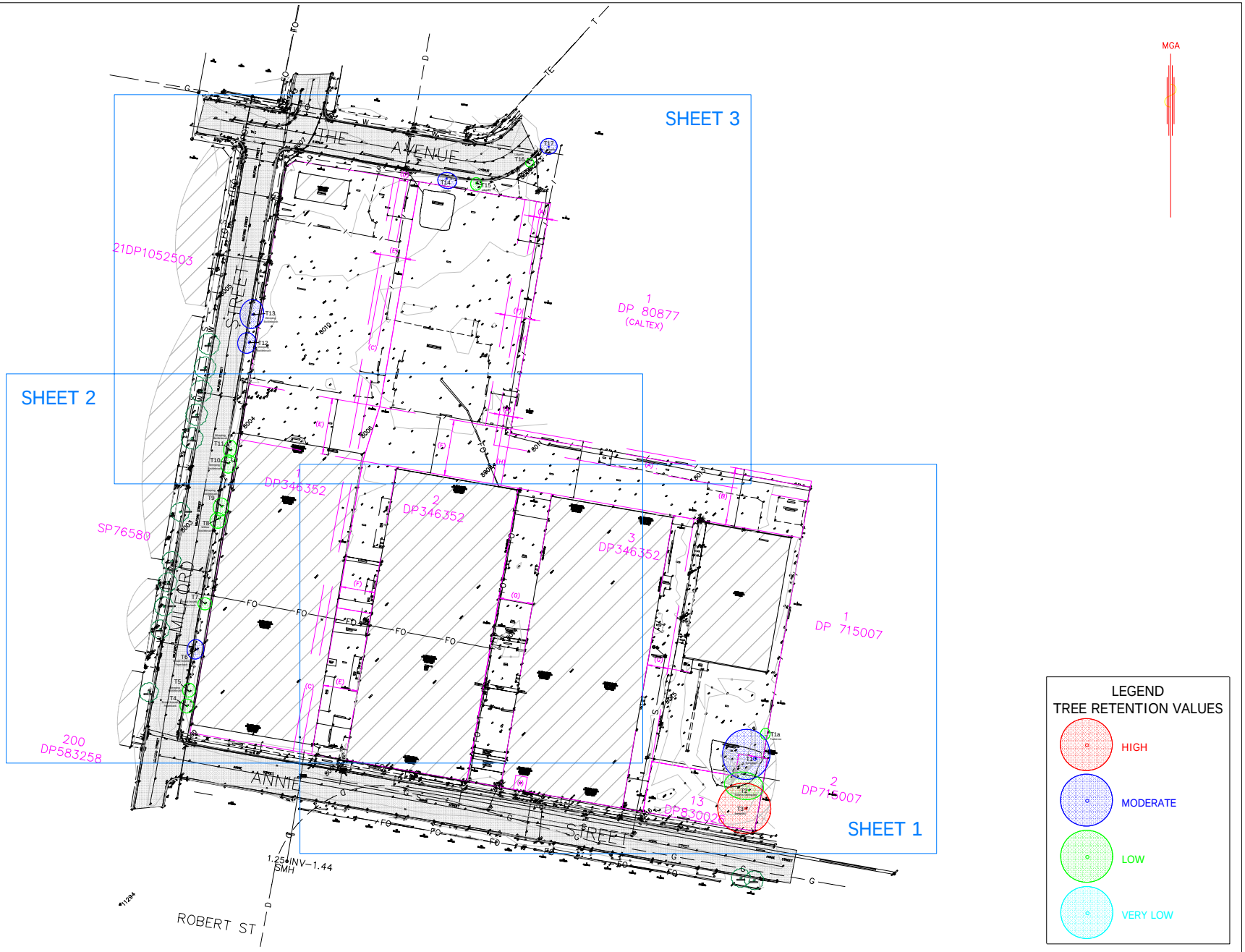


APPENDIX 5
TREE LOCATION PLAN SHOWING
TREE RETENTION VALUES
Wickham Woolstore
33-57 Annie Street, WICKHAM

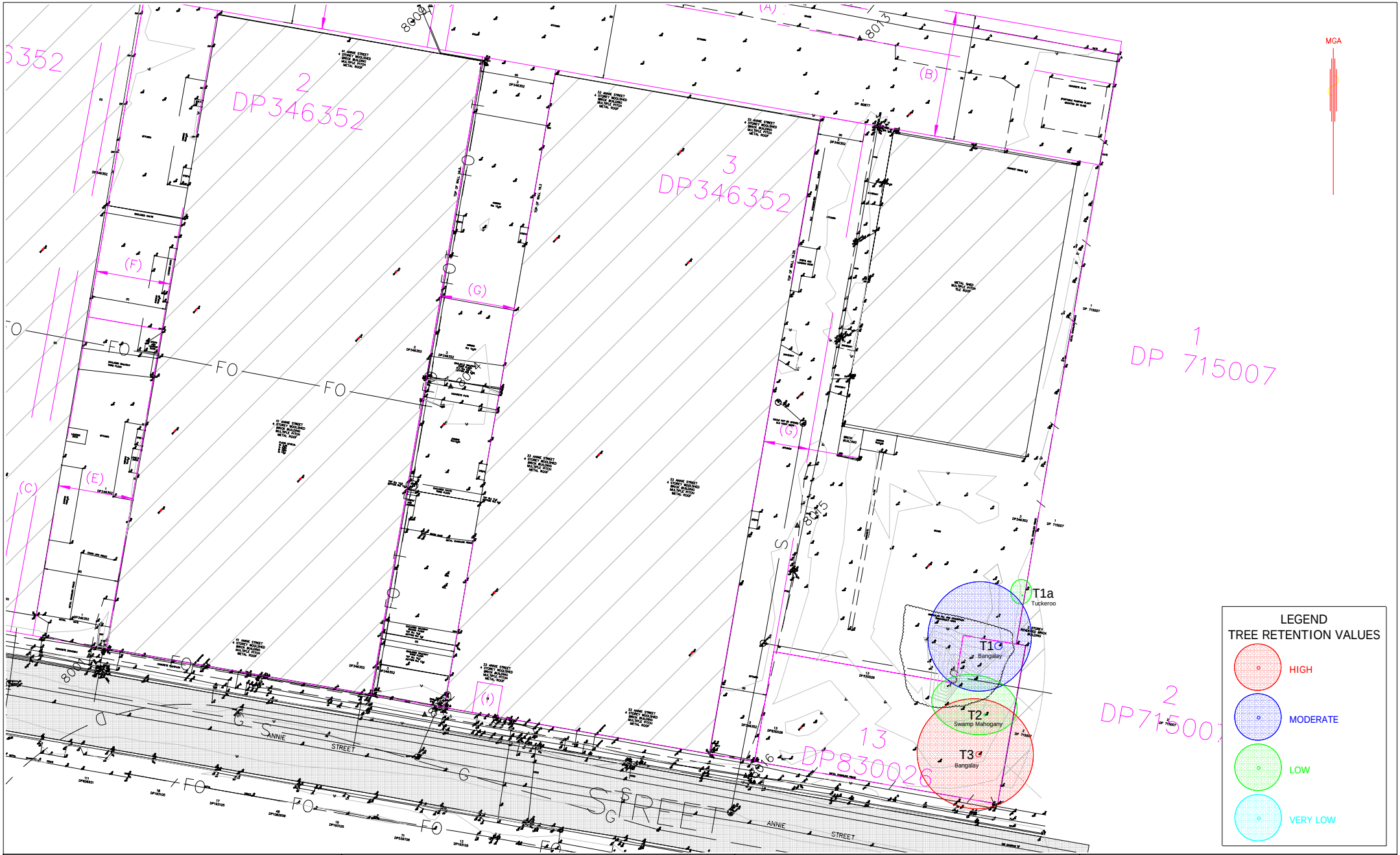
Earthscape Horticultural Services
Arboricultural and Horticultural Consultants
PO Box 364
BEROWRA NSW 2081
Ph: 02 9456 4787
Fax: 02 9456 5757 e: earthscape@iinet.net.au

Based on the Survey Drawing
prepared by Monteath & Powys Pty Ltd
Dwg Ref No. 150323d [3]
Dated 10/04/2018

DWG No. T18-070301 [A]

KEY PLAN

DATE: 03/07/2018



APPENDIX 5
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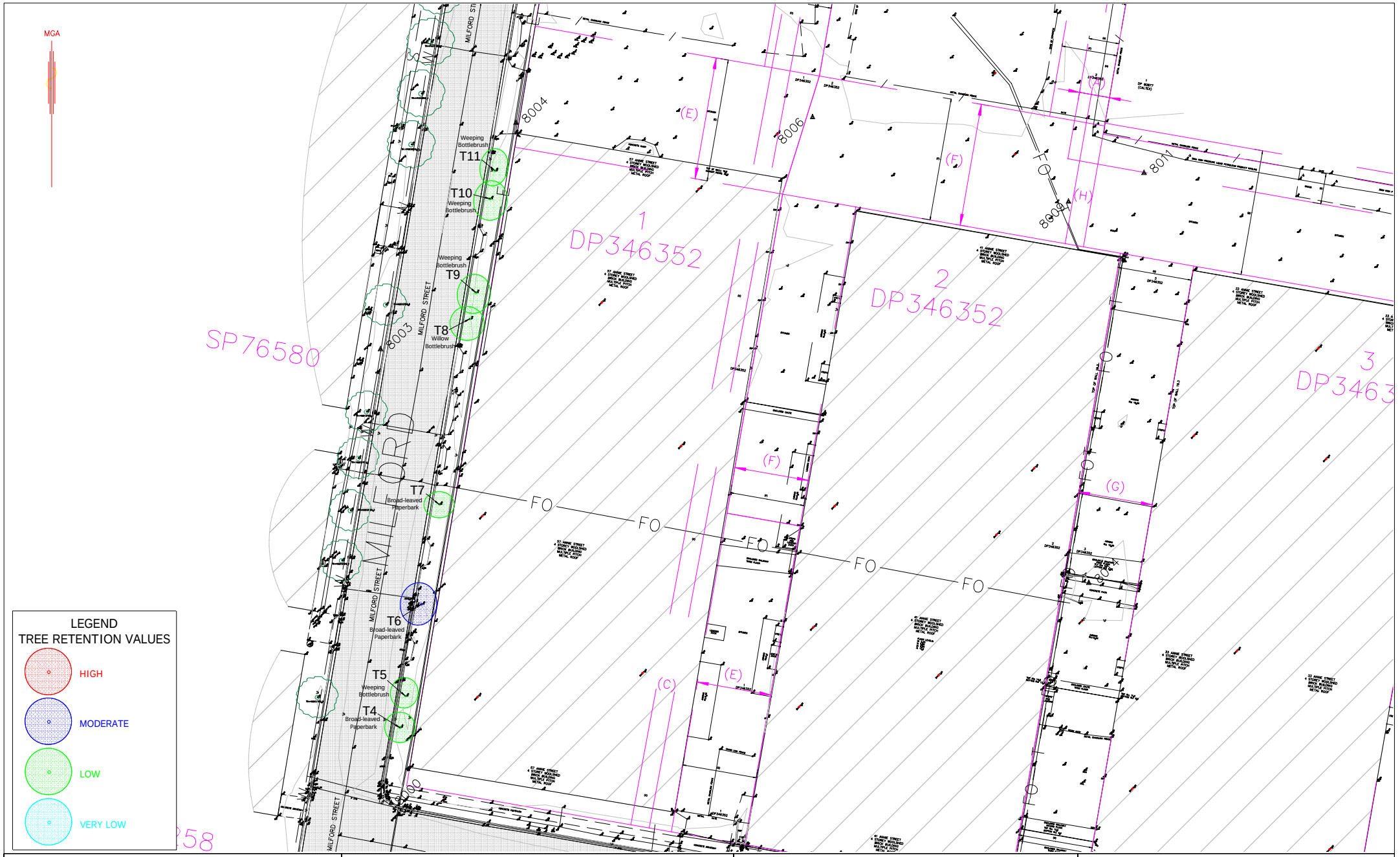
SHEET 1
DATE: 03/07/2018



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SHEET 2
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APPENDIX 5
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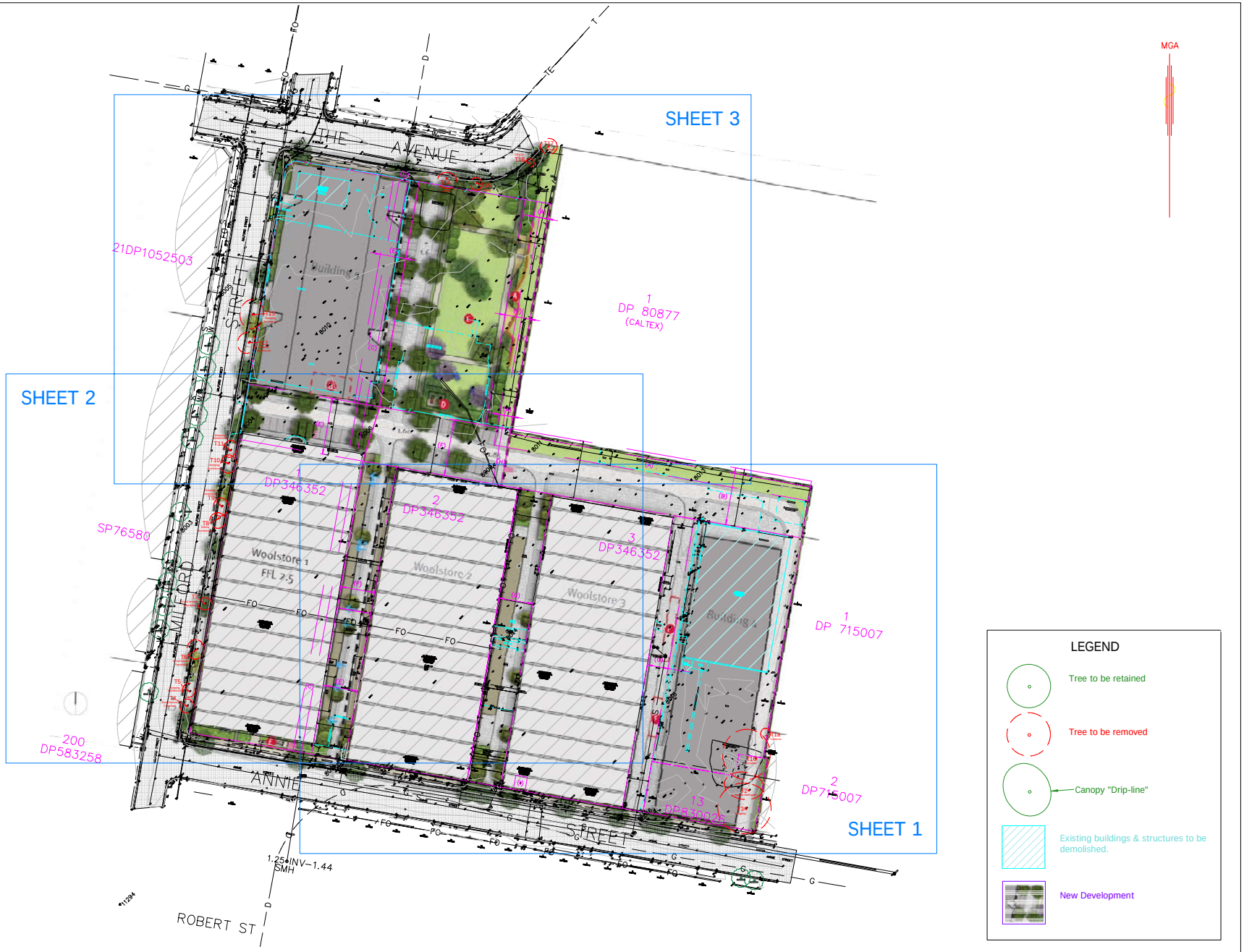
SHEET 3

DATE: 03/07/2018



APPENDIX 6

TREE PROTECTION PLAN

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KEY PLAN

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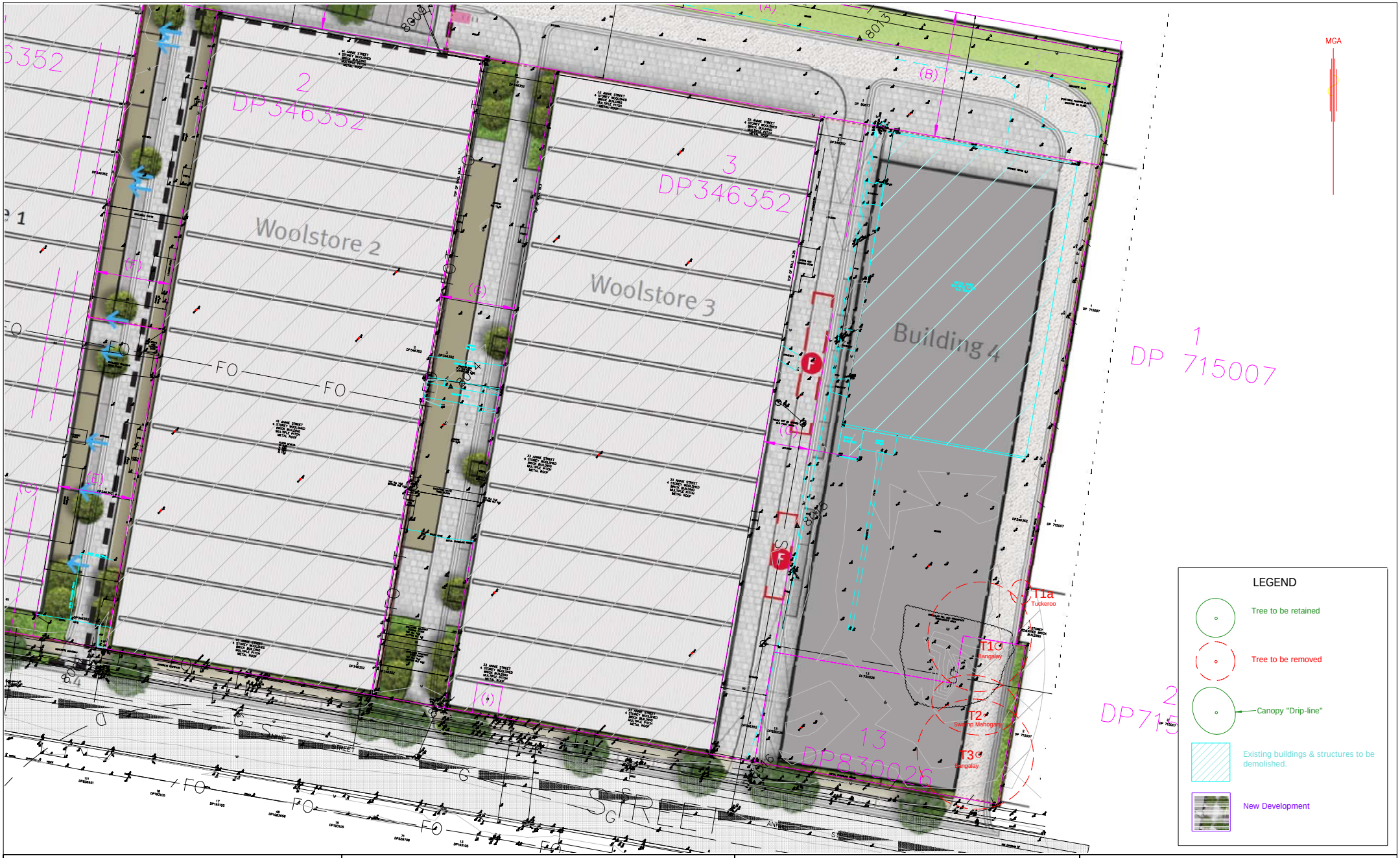

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SHEET 1

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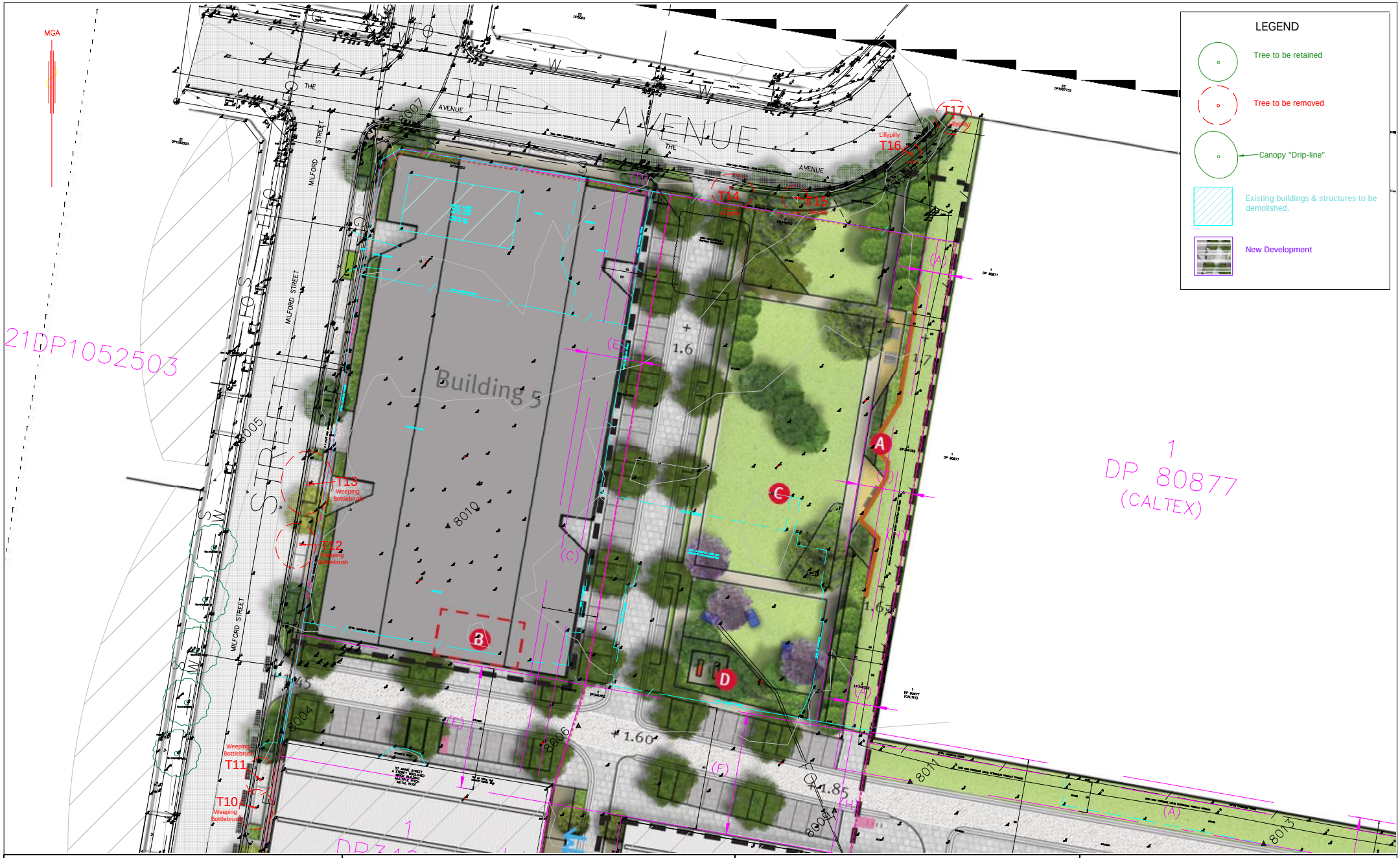
SHEET 2

DATE: 03/07/2018



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