EARTHSCAPE HORTICULTURAL SERVICES
Arboricultural, Horticultural and Landscape Consultants

ABN 36 082 126 027

ARBORICULTURAL IMPACT ASSESSMENT REPORT

PROPOSED MULTI-UNIT RESIDENTIAL DEVELOPMENT

175-177 WELLINGTON ROAD, SEFTON

June 2015

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1 INTRODUCTION

1.1.1 This report was commissioned by the NSW Land and Housing Corporation to assess the health and condition of fourteen (14) trees located within or immediately adjacent to 175-177 Wellington Road, Sefton. The report has been prepared to aid in the assessment of a Development Application (DA) for the demolition of the existing dwellings and construction of a new multi-unit residential development within the property.

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 Bankstown Council's guidelines for preparation of Arborists Reports as outlined in Part B11 of the *Bankstown Development Control Plan* (BDCP) 2015and 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 two (2) residential allotments known as Lots 1 & 2 in DP 35610, being 175-177 Wellington Road, Sefton. For the purposes of this report, the subject allotments will be referred to as "the Site". The total area of the site is 1,441.7 m². The site is zoned Medium Density Residential [R3] under the *Bankstown Local Environmental Plan* (BLEP) 2015. Each lot contains an existing single-storey dwelling in the central northern portions of the lots, together with several small outbuildings. The site has a slight to moderate north-westerly gradient with established lawns and a number of mature and semi-mature trees. These include a variety of exotic (introduced) and non-local native species.

2.1.2 The soils of this area are typical of the Blacktown Soil Landscape Group (as classified in the *Soil Landscapes of the Sydney 1:100,000 Sheet*), consisting of shallow to moderately deep (less than 1000 mm) *Red & Brown Podzolic Soils* on crests, upper slopes and well drained areas. Soils on lower slopes and areas of poor drainage consist of deep (1500-3000 mm) *Yellow Podzolic Soils and Soloth Soils* derived Wianamatta Group & Hawkesbury Shales.[1] The landscape generally consists of undulating rises with slopes ranging usually less than 5% grade.

2.1.3 The original vegetation of this area consisted of Turpentine-Ironbark Forest, most of which was cleared for agriculture in the late 19th Century then later for residential development. The dominant locally-indigenous tree species formerly found in this area included *Eucalyptus fibrosa ssp. fibrosa* (Broad-leaved Ironbark), *Eucalyptus longifolia* (Woollybutt) and *Syncarpia glomulifera* (Turpentine). Other species occurring in this vegetation community may include *Eucalyptus parramattensis* (Drooping Red Gum), *Eucalyptus eugenioides* (Thin-leaved Stringybark), *Eucalyptus sclerophylla* (Hard-leaved Scribbly Gum), *Eucalyptus sideroxylon* (Mugga Ironbark), *Melaleuca decora* (White Feather Honey Myrtle) and *Melaleuca nodosa*. [2]

3 SUBJECT TREES

3.1.1 The subject trees were inspected by Earthscape Horticultural Services (EHS) on the 19th June 2015. 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 Degotardi Smith & Partners, Dwg. Ref No. 34115A01.DWG dated 22/05/2015. The numbers used on this plan correlate with the Tree Assessment Schedule (**Appendix 3**). Tree No. T14 was not shown on the original survey and has been plotted on the drawing in its approximate position.

4 HEALTH AND CONDITION ASSESSMENT

4.1 Methodology

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

4.1.2 The following information was collected for each tree:-

- Tree Species (Botanical & Common Name);
- Approximate height;
- Canopy spread; measured using 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.

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[4] 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)

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 amenity, environmental and heritage 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 in a consistent approach, the assessment criterion 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 Bankstown City Local Government Area (LGA) are protected under Part B11 of the *Bankstown Development Control Plan* (BDCP) 2015, made pursuant to Section 5.9 of the *Bankstown Local Environmental Plan* (BLEP) 2015. The BDCP generally protects all trees with a height of five (5) metres or greater. The following trees are exempt (not protected) under the provisions of Bankstown Council's DCP:-

Tree No.	Species	Exemption
T7	*Grevillea robusta* (Silky Oak)	Dead tree (Clause 2.6)
T6 & T12	*Cinnamomum camphora* (Camphor Laurel)	Environmental Weed Species [Clause 2.7 (d)]
T8 & T9	*Ligustrum lucidum* (Large-leaved Privet)	Environmental Weed Species [Clause 2.7 (a)]
T14	Unidentified species	Located within 3 metres of an existing dwelling [Clause 2.5]
T13	*Trachycarpus fortunei* (Chinese Windmill Palm)	Less than 5 metres in height
T3#	*Callistemon viminalis* (Weeping Bottlebrush)#	Less than 5 metres in height

It should be noted that Tree No. T3 [*Callistemon viminalis* (Weeping Bottlebrush)] whilst exempt from Council's DCP is afforded some protection under Section 138 (c) of the *Roads Act* (NSW) 1993 and Section 629 of the *Local Government Act* (NSW) 1993, being located within the adjoining Road Reserve.

The remainder of the trees are protected under the BDCP 2015.

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 or other visible signs of wildlife habitation.

5.2.3 Noxious Plants & Environmental Weeds

Ligustrum lucidum (Large-leaved Privet) [T8 & T9] is scheduled as a Class 4 Noxious Weed under the meaning of the *Noxious Weeds Act* (NSW) 1993. The growth of this plant species must be managed in a manner that continuously inhibits the ability of the plant to spread.

Grevillea robusta (Silky Oak) [T10 & T11], whilst protected under the BDCP, is considered to be an Environmental Weed Species in some Local Government Areas within the Sydney Metropolitan Area.

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 *Environmental Protection and Biodiversity Conservation Act* 1999.

The National Parks and Wildlife Service (NPWS) 1:25000 Mapping Series (Native Vegetation of the Cumberland Plain) [5] indicates that there are no remnant native vegetation communities within or in the vicinity of the site

There are no areas of Biodiversity Significance within or near to the site as identified on Council's Terrestrial Biodiversity Map forming part of the BLEP 2015.

5.3 Heritage Significance

5.3.1 Heritage Items

The subject property is *not* listed as an item of Environmental Heritage under Schedule 5, Part 1 of the *Bankstown Local Environmental Plan* BLEP 2015. There is no known or suspected heritage significance of any of the subject trees.

5.3.2 Heritage Conservation Area

The site is *not* located within a Heritage Conservation Area under Schedule 5, Part 2 of the BLEP 2015.

5.3.3 Significant Tree Register

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

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							

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).[6]

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 Incursions 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.

7.1 Acceptable Incursions to the Canopy.

7.1.1 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.

7.1.2 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

7.2 Legal Protection

7.2.1 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 BDCP). In Bankstown City LGA, a tree located within three (3) metres of the wall of a dwelling is not protected under the BDCP. The measurement is taken from the centre of the trunk of the tree to the external wall of the dwelling. As such, if a tree is considered worthy of preservation, Council is unlikely to approve the construction of a dwelling 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 demolition of the existing dwellings and outbuildings and construction of a new multi-unit residential development within the property, including a basement car parking area.

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
Site/Ground Floor Plan	Housing NSW	BGKW-SK2015Rev B S3	19/06/2015
Basement Plan	Housing NSW	BGKW-SK2015Rev B S4	19/06/2015
First, Second & Third Floor Plan	Housing NSW	BGKW-SK2015Rev B S5-S7	19/06/2015
Roof Plan	Housing NSW	BGKW-SK2015Rev B S8	19/06/2015
Elevations	Housing NSW	BGKW-SK2015Rev B S9	19/06/2015
Sections	Housing NSW	BGKW-SK2015Rev B S10	19/06/2015

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 five (5) trees of low and very low retention value. These include Tree No.s T7 & T11 (Silky Oak), T12 (Camphor Laurel), T13 (Chinese Windmill Palm) and T14 (Unidentified Species). None of these trees are considered significant or worthy of special measures to ensure their preservation. It should be noted that Trees 12, 13 & 14 are exempt from BDCP 2015. A further four (4) trees of low retention value, whilst not affected by the proposed development, are also recommended for removal. These include Trees T6 (Camphor Laurel), T8 & T9 (Broad-leaf Privet) and T10 (Silky Oak). All of these trees are considered to be Environmental Weed Species. It should be noted that Trees T6, T8 & T9 are also exempt from BDCP 2015.

9.1.4 The proposed development will also necessitate the removal of two (2) trees of moderate retention value. These include Tree No.s T1 (a Jacaranda) and T2 (Fiddlewood). These trees are not considered significant, but are in good health and condition and make a fair contribution to the amenity of the site and surrounding properties. In order to compensate for loss of amenity resulting from the removal of these trees to accommodate the proposed development, consideration should be given to replacement planting within the site in accordance with Section 11.

9.1.5 A proposed lawn terrace area and low retaining wall are located within the TPZ of T4 (a young White Cedar located within the adjoining property). Excavations for the terrace and wall foundations will result in a substantial encroachment to the TPZ (20%) which will result in an adverse impact on this tree. In order to avoid and adverse impact, the proposed retaining wall should be relocated outside the TPZ and existing ground levels within the TPZ of this tree (2.3 metre radius) should be maintained intact.

9.1.6 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 All trees within the site to be retained shall be protected prior to and during construction from all activities that may result in detrimental impact by erecting a suitable protective fence beneath the canopy to the full extent of the Tree Protection Zone, excluding the footprint of the proposed works and areas within adjoining properties, as indicated on the Tree Protection Plan. As a minimum, the fence should 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.

10.3.2 Appropriate signage shall be installed on the fencing to prevent unauthorised movement of plant and equipment or entry to the Tree Protection Zone.

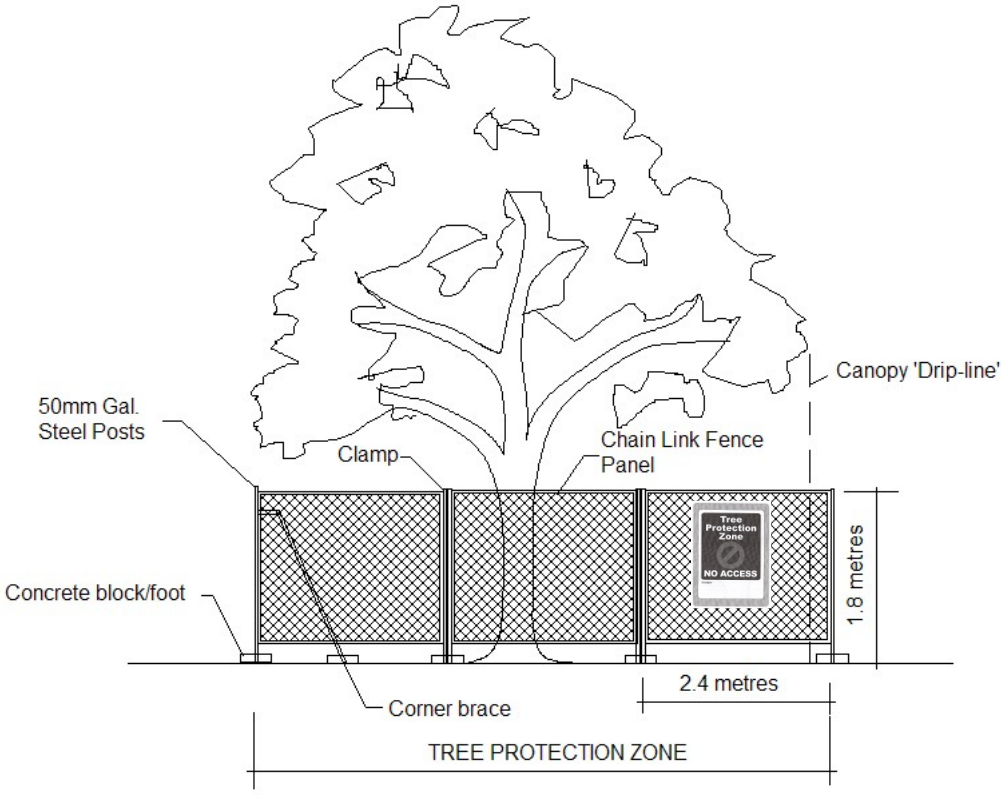


Figure 1 – Detail of Tree Protection Fence

10.4 Tree Protection Signs

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

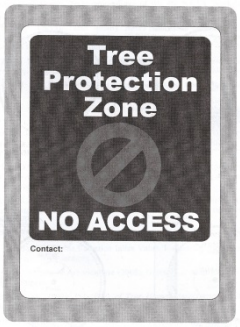


Figure 2 – Detail of Tree Protection Sign

10.5 Demolition Works within Tree Protection Zones

10.5.1 Demolition of paved areas within the Tree Protection Zones of trees to be retained shall be undertaken under the supervision of the Site Arborist. The pavement surface and sub-base within the TPZ shall be gradually removed in layers of no greater than 50mm thick using a small rubber tracked excavator or alternative approved method to avoid damage to underlying roots and minimise disturbance and compaction of the underlying soil profile. The machine shall work within the footprint of the existing paved surfaces 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 damage to woody roots.

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

10.5.3 Demolition of existing walls, kerbs and other structures within the Tree Protection Zone of trees to be retained shall be undertaken under the supervision of the Site Arborist. The structures shall be demolished using equipment on stationed outside the TPZ where possible or within the footprint of existing hardstand areas. 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.

10.6 Excavations within Tree Protection Zones

10.6.1 Prior to any mechanical excavations for building foundations or pavement sub-grade within the Tree Protection Zone of all trees nominated for retention, 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. All care shall be undertaken to preserve woody roots intact and undamaged during exploratory excavation. Any roots encountered of less than 50mm 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.

10.6.2 Where large woody roots (greater than 50mm diameter) are encountered during exploratory excavations, further advice from a qualified arborist shall be sought prior to severance. 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.

10.6.3 For masonry walls or fences it may be acceptable to delete continuous concrete strip footings and replace with suspended in-fill panels (eg 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 All proposed stormwater lines and other underground services should be located outside TPZs of trees proposed to be retained wherever possible or installed by alternative measures. Alternative measures include suspending pipelines beneath the floor of a building or structure (to avoid excavation with the TPZ), non-destructive excavation methods or Horizontal Directional Drilling (HDD). Where the installation of service lines within TPZs is unavoidable, the pipelines or conduits should be installed as follows.

10.7.2 Where the extent of the incursion to the root zone is less than 10% of the TPZ including any excavations for benching and shoring the trench, the pipeline or conduit may be installed by open trenching using standard construction methods (excavator or trenching machine). 10% of the TPZ is equivalent to one-third of the TPZ radius on one side (refer to **Appendix 2**). Refer to **Appendix 4** for radial distances of TPZs for each tree.

10.7.3 Where the extent of the incursion to the root zone exceeds 10% of the TPZ, but is outside the SRZ, non-destructive excavation methods must be adopted in accordance with **Section 10.6**. Where large woody roots are encountered during excavation or trenching (root diameter greater than 50mm), 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.

10.7.4 Excavations required for underground services within the Structural Root Zone of any tree to be retained should only be undertaken by sub-surface boring (Horizontal Directional Drilling). 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 Pavements should be avoided within the Tree Protection Zone of trees to be retained where possible. Proposed paved areas within the Tree Protection Zone of trees to be retained should be placed above grade to minimise excavations within the root zone and avoid root severance and damage. Pavement sub-base material should be as per **Section 10.10**.

10.9 Fill Material

10.9.1 Placement of fill material within the Tree Protection Zone of trees to be retained should be avoided wherever possible. Where placement of fill is unavoidable, the material should 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. The fill may be consolidated but should not

be compacted to engineering standards. No fill material should be placed in direct contact with the trunk.

10.9.2 Where placement of fill is required for pavement sub-grade is required within TPZs of trees to be retained, a coarse, gap-graded material such as 20 – 50mm crushed basalt (Blue Metal) or equivalent shall be used to provide some aeration to the root zone. Note that Roadbase or crushed sandstone or other material containing a high percentage of fines is unacceptable for this purpose. The fill material should be consolidated with a non-vibrating roller 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.

10.10 Canopy & Root Pruning

10.10.1 All canopy pruning work required shall be carried out in accordance with Australian Standard 4373-2007 – Pruning of Amenity Trees. Written approval from Council may be required under the Tree Preservation Order prior to undertaking this work. 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].

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

10.11 Tree Damage

10.11.1 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.

10.11.2 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.

10.12 Tree Removal

10.12.1 The approval of Bankstown City Council shall be obtained prior to the removal or pruning of any tree protected under the Tree Preservation Order.

10.12.2 Tree removal work 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.

10.12.3 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.

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 five (5) new trees capable of attaining a height of at least twelve (12) metres at maturity should be planted within the allotment. Replacement trees should preferably include some locally indigenous species. These will be most appropriate to the site conditions and be most valuable in terms of preserving the landscape character and wildlife habitat of the area. The following species are appropriate to the site conditions and could be considered for replacement planting:-

- *Syzygium paniculatum* (Magenta Cherry)
- *Syncarpia glomulifera* (Turpentine)
- *Angophora costata* (Sydney Red Gum)
- *Corymbia maculata* (Spotted Gum)
- *Allocasuarina torulosa* (Forest Oak)
- *Eucalyptus fibrosa* (Broad-leaved Ironbark)
- *Acmena smithii* (Lillypilly)

Andrew Morton
EARTHSCAPE HORTICULTURAL SERVICES
25th June 2015

REFERENCES:-

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

[2] Benson, Doug & Howell, Jocelyn (1990)
Taken for Granted: the Bushland of Sydney and its Suburbs.
Kangaroo Press & The Royal Botanic Gardens, Sydney, NSW

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

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

[5] National Parks and Wildlife Service of NSW (October 2002)
Native Vegetation of the Cumberland Plain - 1:25000 Mapping Series (Map 10 of 16)
NPWS, Sydney NSW

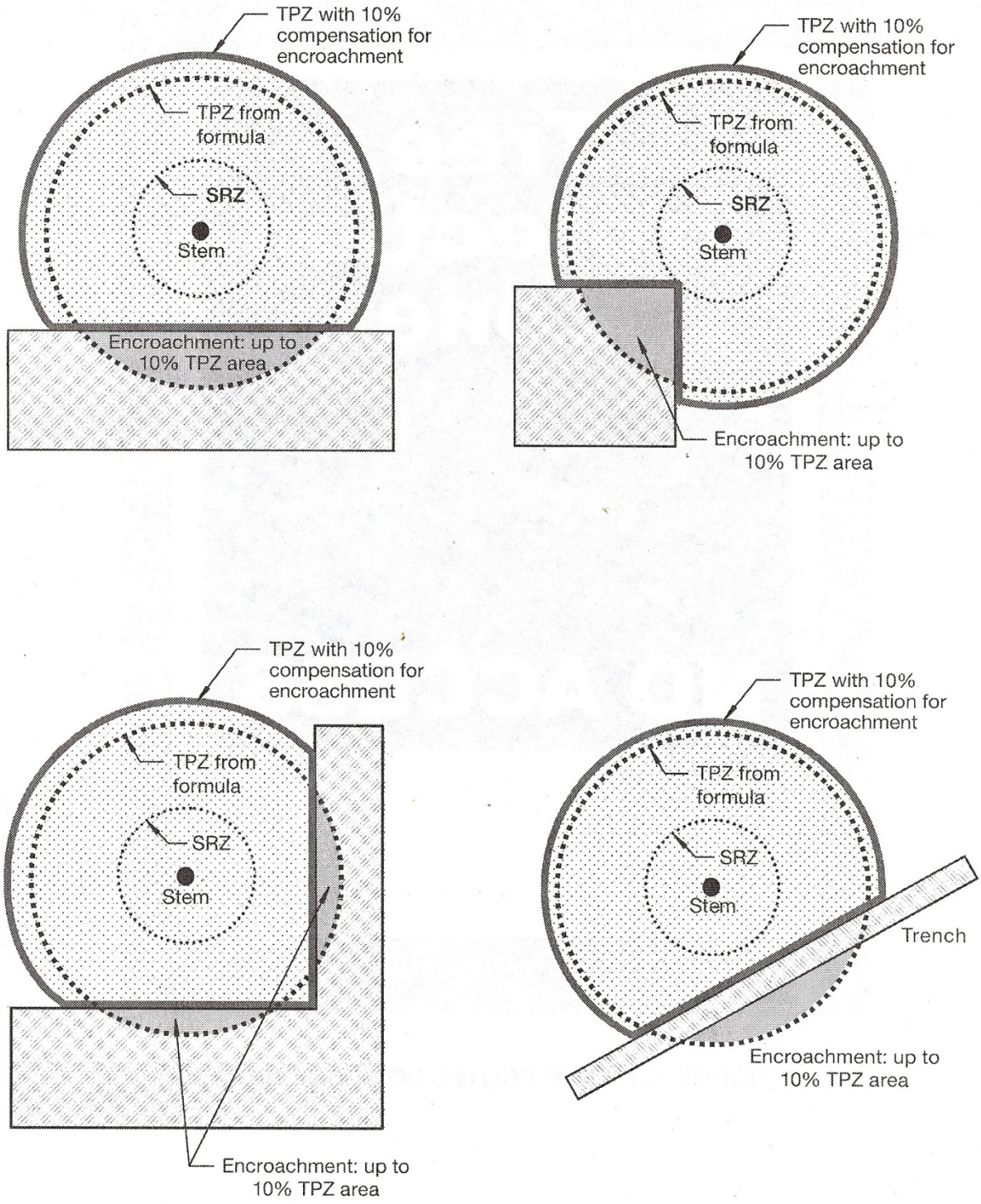
[6] Council of Standards Australia (August 2009)
AS 4970 – 2009 – Protection of Trees on Development Sites
Standards Australia, Sydney

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	***Jacaranda mimosifolia*** (Jacaranda)	8	9	210 + 300	54	M	Appears stable with fair branching structure. Exhibits multiple moderate wounds & crown suppressed on north side due previous pruning. Exhibits a large woody surface root to the west/SW.	Selectively pruned north side to clear overhead powerlines	Good	No Evidence	Medium 15-40 Years	4	**Moderate**	On-site
2	***Citharexylum spinosum*** (Fiddlewood)	8	8	120x7	64	M	Appears stable with fair branching structure. Exhibits multiple co-dominant primary limbs arising from GL.	May have been previously cut to ground level (crown restored)	Very Good	No Evidence	Medium 15-40 Years	4	**Moderate**	On-site
3	***Callistemon viminalis*** (Weeping Bottlebrush)	3	3.5	70x3	10.5	SM	Appears stable with fair branching structure.	No Evidence	Good	No Evidence	Long - more than 40 years	5	**Moderate**	Nature strip
4	***Melia azedarach*** (White Cedar)	5	5	150	17.5	I	Appears stable with fair branching structure. Exhibits multiple moderate bark inclusions at 2-3 metres.	No Evidence	Fair	Moderate foliar insect infestation (Processional Caterpiller)	Medium 15-40 Years	5	**Low**	Adjoining property
5	***Jacaranda mimosifolia*** (Jacaranda)	10	9	240 + 200	81	M	Appears stable with sound branching structure. Exhibits a low bark inclusion at GL.	No Evidence	Good	Moderate vine infestation.	Long - more than 40 years	4	**Moderate**	On-site
6	***Cinnamomum camphora*** (Camphor Laurel)	8	8	280 + 200	56	SM	Appears stable with sound branching structure.	No Evidence	Good	High vine infestation.	Medium 15-40 Years	6	**Low**	On-site
7	***Grevillea robusta*** (Silky Oak)	9	3	166	0	OM	Stability suspect with poor branching structure.	Crown lifted to 2 metres	Dead	No Evidence	Nil	7	**Very Low**	On-site
8	***Ligustrum lucidum*** (Large-leaved Privet)	4	5	50x6	20	I	Appears stable with fair branching structure.	May have been previously cut to ground level (crown restored)	Fair	No Evidence	Long - more than 40 years	7	**Very Low**	On-site
9	***Ligustrum lucidum*** (Large-leaved Privet)	7	5	180	25	SM	Appears stable with fair branching structure. Crown suppressed on the west side due to previous pruning. Multiple moderate bark inclusions at 1-2 metres.	No Evidence	Good	No Evidence	Long - more than 40 years	7	**Very 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				
10	***Grevillea robusta*** (Silky Oak)	11	3	150	18	I	Appears stable with sound branching structure. Crown suppressed on the north side due to crowding. Minor dieback with 5% deadwood.	No Evidence	Fair	No Evidence	Medium 15-40 Years	6	**Low**	On-site
11	***Grevillea robusta*** (Silky Oak)	12	7	125 + 250	70	SM	Appears stable with sound branching structure. Exhibits a moderate bark inclusion at GL.	Crown lifted to 4 metres (west side, over boundary)	Good	No Evidence	Medium 15-40 Years	6	**Low**	On-site
12	***Cinnamomum camphora*** (Camphor Laurel)	3.5	3	40x4	7.5	I	Appears stable with fair branching structure. Multiple epicormics arising from GL.	May have been previously cut to ground level (crown restored)	Very Good	No Evidence	Long - more than 40 years	6	**Low**	On-site
13	***Trachycarpus fortunei*** (Chinese Windmill Palm)	2	1.5	180	1.5	I	Appears stable with sound branching structure.	No Evidence	Good	No Evidence	Long - more than 40 years	6	**Low**	On-site
14	**Unidentified species**	5.5	7	120 + 50x5	38.5	SM	Appears stable with fair branching structure.	No Evidence	Very Good	No Evidence	Long - more than 40 years	6	**Low**	On-site

APPENDIX 4 - IMPACT ASSESSMENT SCHEDULE

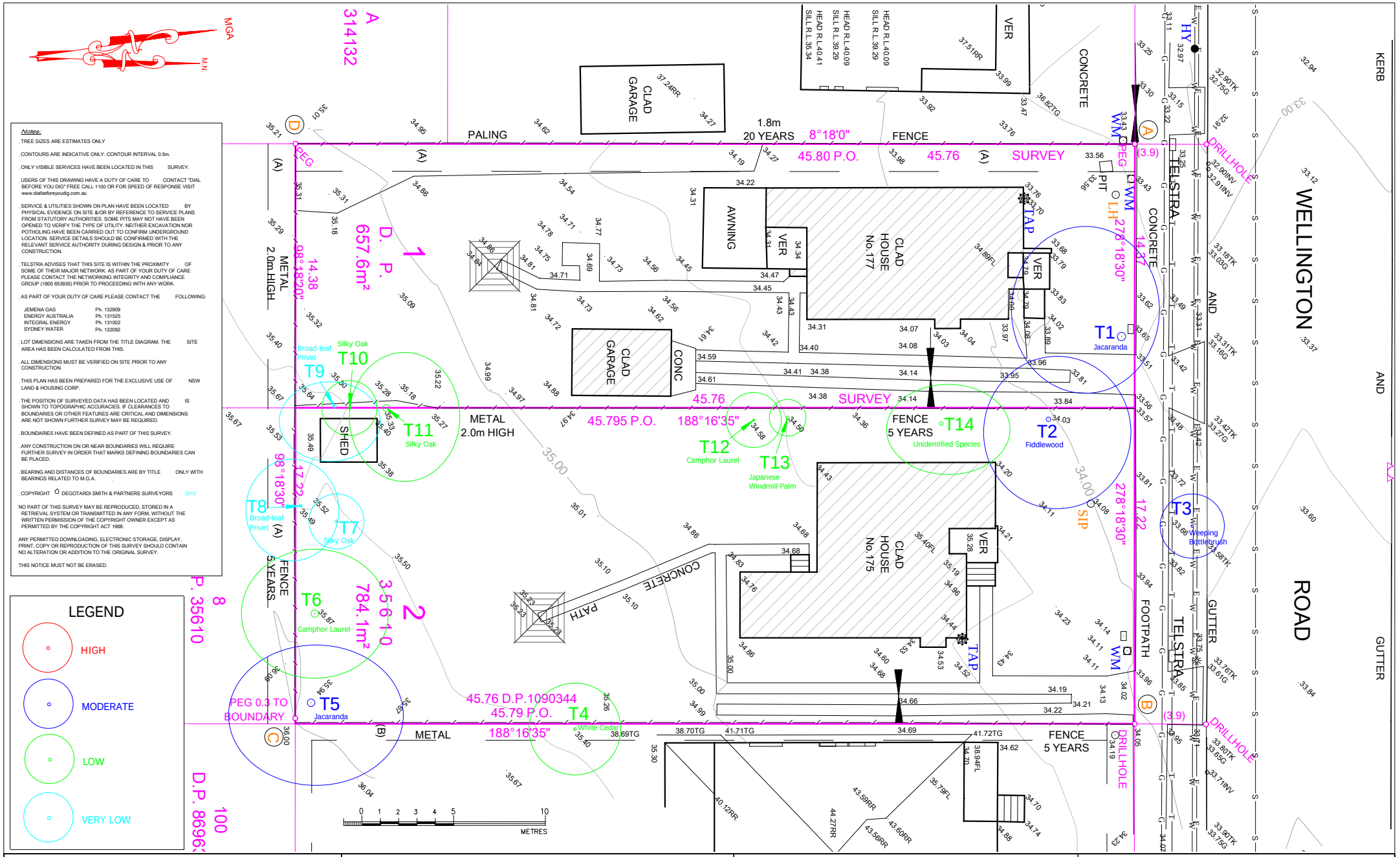
Tree Identification No.	Species	Construction Tolerance	Tree Protection Zone (m R)	Structural Root Zone (m R)	TPZ (m^2)	Incursions To Root Zone &/or Canopy	Likely Impact	Recommendation
1	***Jacaranda mimosifolia*** (Jacaranda)	M	6.0	2.3	113.0	Proposed lawn terrace and associated retaining wall offset 500mm south at RL 34.250 (500mm above grade). Excaavtions for wall foundations and non-engineered fill for terrace within SRZ/TPZ. Proposed pathway offset 1.2 metres west at RL 33.65 (close to existing grade) and 2.4 metres east at RL 33.750 (200mm above grade). Excavations and engineered fill for pavement sub-grade within TPZ/SRZ. Proposed dwelling offset 5.3 metres south at RL 34.30 (300mm above grade). Cut and fill for building foundations within TPZ. Encroachment to TPZ = 45%. Some canopy pruning required to accomodate temporary scaffolding (25-30% canopy loss).	Proposed works will result in a significant adverse impact	Remove tree. Undertake replacement planting elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
2	***Citharexylum spinosum*** (Fiddlewood)	M	4.5	2.0	63.6	Located within footprint of proposed porch to Unit 2	Proposed works will necessitate removal.	Undertake replacement planting elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
3	***Callistemon viminalis*** (Weeping Bottlebrush)	M	1.8	1.5	10.2	No proposed works within TPZ	No adverse impact	Retain in accordance with recommended Tree Protection Measures (Section 10). Install Tree Protection Fencing in accordance with Section 10.3.
4	***Melia azedarach*** (White Cedar)	M	2.3	1.5	15.9	Proposed terrace lawn area and associated retaining wall offset 800mm NW at RL 35.195 (200mm below grade). Excavations for terrace and retaining wall foundations within SRZ/TPZ. Encroachment to TPZ = 20%.	Excavations for terrace and wall foundations will result in a significant adverse impact.	Retain in accordance with recommended Tree Protection Measures (Section 10). Relocate retaining wall outside TPZ and maintain existing ground levels within TPZ.
5	***Jacaranda mimosifolia*** (Jacaranda)	M	4.5	2.0	63.6	No proposed works within TPZ	No adverse impact	Retain in accordance with recommended Tree Protection Measures (Section 10). Install Tree Protection Fencing in accordance with Section 10.3.

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
6	***Cinnamomum camphora*** (Camphor Laurel)	M	4.8	2.1	72.3	Proposed patio to Unit 6 offset 2.9 metres north at RL 35.45 (150-200mm below grade). Excavations for patio within TPZ. Encroachment to TPZ = 8%.	Extent of encroachment to the root zone is less than 10% of the TPZ, which is considered within acceptable limits under AS 4970:2009. No adverse impact.	Remove tree (Environmental Weed Species). Undertake replacement planting elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
7	***Grevillea robusta*** (Silky Oak)	M	2.5	1.6	19.4	No proposed works within TPZ	No adverse impact	Remove tree (Dead tree)
8	***Ligustrum lucidum*** (Large-leaved Privet)	M	2.3	1.5	15.9	No proposed works within TPZ	No adverse impact	Remove tree (Environmental Weed Species). Undertake replacement planting elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
9	***Ligustrum lucidum*** (Large-leaved Privet)	M	2.7	1.6	22.9	No proposed works within TPZ	No adverse impact	Remove tree (Environmental Weed Species). Undertake replacement planting elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
10	***Grevillea robusta*** (Silky Oak)	M	2.3	1.5	15.9	No proposed works within TPZ	No adverse impact	Remove tree (Environmental Weed Species). Undertake replacement planting elsewhere within the site to compensate for loss of amenity in accordance with Section 11.
11	***Grevillea robusta*** (Silky Oak)	M	4.9	2.1	74.6	Proposed dwelling (Units 5 & 6) offset 1 metre north at RL 35.50 (2-300mm above grade). Excavations for building foundations within SRZ.	Excavations for building foundations will result in a significant adverse impact.	Remove tree.
12	***Cinnamomum camphora*** (Camphor Laurel)	M	1.5	1.1	7.1	located within footprint of proposed dwelling & basement	Proposed works will necessitate removal.	Remove tree.
13	***Trachycarpus fortunei*** (Chinese Windmill Palm)	G	2.2	1.6	14.6	located within footprint of proposed dwelling & basement	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
14	**Unidentified species**	M	3.5	1.7	38.5	located within footprint of proposed dwelling.	Proposed works will necessitate removal.	Remove tree.



Notes:

TREE SIZES ARE ESTIMATES ONLY

CONTOURS ARE INDICATIVE ONLY. CONTOUR INTERVAL 0.5m.

ONLY VISIBLE SERVICES HAVE BEEN LOCATED IN THIS SURVEY.

USERS OF THIS DRAWING HAVE A DUTY OF CARE TO BEFORE YOU DIG" FREE CALL 1100 OR FOR SPEED OF RESPONSE VISIT www.dialbeforeyoudig.com.au CONTACT "DIAL

SERVICE & UTILITIES SHOWN ON PLAN HAVE BEEN LOCATED BY PHYSICAL EVIDENCE ON SITE &/OR BY REFERENCE TO SERVICE PLANS FROM STATUTORY AUTHORITIES. SOME PITS MAY NOT HAVE BEEN OPENED TO VERIFY THE TYPE OF UTILITY. NEITHER EXCAVATION NOR POTHOLING HAVE BEEN CARRIED OUT TO CONFIRM UNDERGROUND LOCATION. SERVICE DETAILS SHOULD BE CONFIRMED WITH THE RELEVANT SERVICE AUTHORITY DURING DESIGN & PRIOR TO ANY CONSTRUCTION.

TELSTRA ADVISES THAT THIS SITE IS WITHIN THE PROXIMITY OF SOME OF THEIR MAJOR NETWORK. AS PART OF YOUR DUTY OF CARE PLEASE CONTACT THE NETWORKING INTEGRITY AND COMPLIANCE GROUP (1800 653935) PRIOR TO PROCEEDING WITH ANY WORK.

AS PART OF YOUR DUTY OF CARE PLEASE CONTACT THE FOLLOWING:

JEMENA GAS	Ph. 132909
ENERGY AUSTRALIA	Ph. 131525
INTEGRAL ENERGY	Ph. 131002
SYDNEY WATER	Ph. 132092

LOT DIMENSIONS ARE TAKEN FROM THE TITLE DIAGRAM. THE SITE AREA HAS BEEN CALCULATED FROM THIS.

ALL DIMENSIONS MUST BE VERIFIED ON SITE PRIOR TO ANY CONSTRUCTION.

THIS PLAN HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF NSW LAND & HOUSING CORP.

THE POSITION OF SURVEYED DATA HAS BEEN LOCATED AND IS SHOWN TO TOPOGRAPHIC ACCURACIES. IF CLEARANCES TO BOUNDARIES OR OTHER FEATURES ARE CRITICAL AND DIMENSIONS ARE NOT SHOWN FURTHER SURVEY MAY BE REQUIRED.

BOUNDARIES HAVE BEEN DEFINED AS PART OF THIS SURVEY.

ANY CONSTRUCTION ON OR NEAR BOUNDARIES WILL REQUIRE FURTHER SURVEY IN ORDER THAT MARKS DEFINING BOUNDARIES CAN BE PLACED.

BEARING AND DISTANCES OF BOUNDARIES ARE BY TITLE ONLY WITH BEARINGS RELATED TO M.G.A.

APPENDIX 5
TREE LOCATION PLAN SHOWING TREE RETENTION VALUES

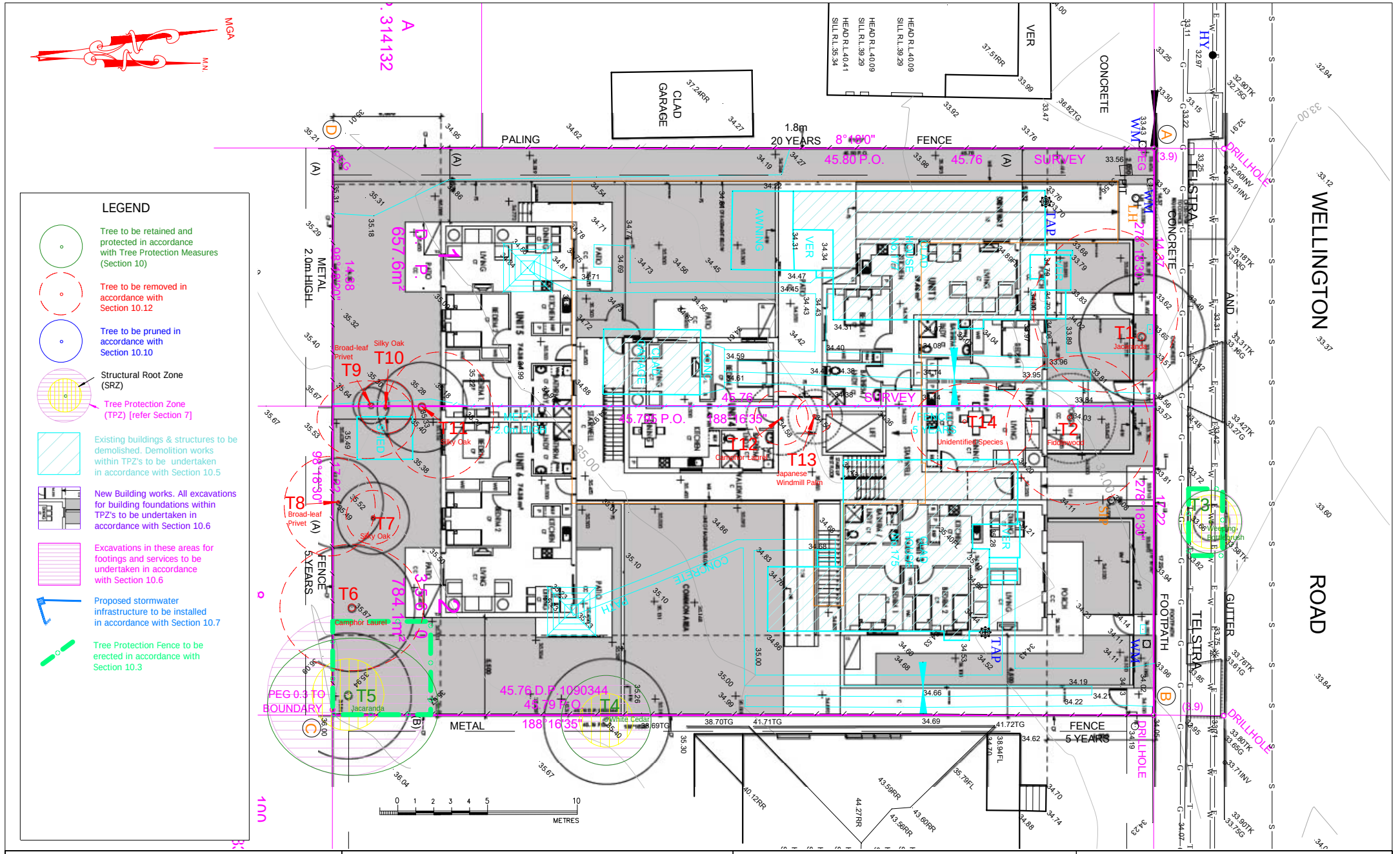
175-177 Wellington Road, SEFTON, NSW

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 Degotardi Smith and partners
Dwg Ref No. 34115A01.DWG
Dated 22/05/2015

DWG No. T15-062301

DATE: 23/06/2015



APPENDIX 6
TREE PROTECTION PLAN

175-177 Wellington Road, SEFTON, 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 Degotardi Smith and partners
Dwg Ref No. 34115A01.DWG
Dated 22/05/2015

DWG No. T15-062302

DATE: 25/06/2015 Issue B