OCULUS

29 April 2022

Brodie McHutchison, Director
CTPG
Suite 14.04, 88 Phillip Street,
Sydney NSW 2000

**Re: Marist Catholic College North Shore (SSD-10473)**
**Response to Submissions 2**

Dear Sirs,

We refer to the response provided by DPIE dated 20.12.21 to the State Significant Development Application for Marist Catholic Collage North Shore and specifically the comments on the landscape design and provide our response as follows.

**5. Trees and landscaping**

The Department requests that the following be provided in relation to tree removal and landscaping:

- confirm the 'as existing' and 'as proposed' tree canopy coverage (in sqm and as a percentage of the total site) to confirm the difference between the existing and proposed canopy coverage.

*Response: 21.9% Existing Canopy Cover = 4 932 m2 or 22%. Proposed Canopy Cover = 5,984 m2 or 26%, comprising 2,546 m2 of existing retained canopy and 3,438 m2 of new canopy.*
*Refer to L-005 and page 53 of Landscape Design Report.*

- clarify the total number of trees for removal and retention. In particular, clarify whether the two trees now proposed for retention (transplanting) are included within the calculation of total number of "trees for removal" (59) OR "trees for retention" (17).

*Response: There are 44 trees proposed for retention (2 high value, 7 moderate value, 13 low value, 21 unspecified value and 1 un-surveyed).*
*There are 64 trees proposed for removal (3 high value, 7 moderate value, 47 low value, 2 unspecified value and 5 un-surveyed).*
*The 2 trees proposed to be transplanted (T8 & T86) are included within the total number of "trees for removal".*
*Refer to L-005.*

- confirm the total number of proposed replacement trees, noting the RtS and Arboricultural Impact Assessment indicate 60 replacements, however, the updated landscape plans indicate 108 (70 at ground level and 38 at roof terrace levels).

*Response: There are 114 replacement trees proposed in the updated landscape plans. Refer to L-005 and L-007-009.*

OCULUS
landscape architecture
urban design pty ltd

PO Box 307
Level 1
5 Wilson Street
Newtown NSW 2042

p 02.9.557.5533
f 02.9.519.8323
keith@oculus.info
www.oculus.info

acn 074.882.447
abn 34.074.882.447

**8. Architectural plans**

The architectural plans are required to be updated as follows:

- correctly show the 6 parking spaces adjacent to St Mary's Church as accessible spaces (currently shown as 7 standard parking spaces).

*Response: The updated landscape plans show the parking spaces adjacent to St Mary's Church as 6 accessible spaces.*

Yours faithfully,

Keith Stead, *Associate Director*
RLA (NSW) 001564

Project No: MCC/NS/20  Report No: MCC/NS/AIA/C

# ARBORICULTURAL IMPACT ASSESSMENT
# TREE PROTECTION SPECIFICATION

## Marist Catholic College
## North Shore

Prepared for: CARMICHAEL TOMPKINS PROPERTY GROUP

16th May 2022
Revision C


**Authors:**

**Anna Hopwood**
Grad. Cert (Arboriculture)
Dip. Horticulture (Arboriculture)
Dip. Horticulture (Landscape Design)

**Martin Peacock**
BSc (hons.) Arboriculture
Dip. Horticulture (Landscape Design)
N Dip. Horticulture

p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au


Arboriculture Australia MEMBER

INSTITUTE OF AUSTRALIAN CONSULTING ARBORICULTURISTS
IACA
MANAGING URBAN TREES™

## Contents





p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

## 1.0 INTRODUCTION

### 1.1 Background

1.1.1 This Arboricultural Impact Assessment Report and Tree Protection Specification was prepared for Carmichael Tompkins Property Group, on behalf of Sydney Catholic Schools, in relation to the proposed State Significant Development Application (SSDA) for the expansion and redevelopment of Marist Catholic College North Shore, which is submitted to the Department of Planning, Industry and Environment (DPIE) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (the Act). Sydney Catholic Schools is the proponent of the SSD DA. This Revision C Report is based on an updated Tree Management Plan (L-005, Rev D, dated 13.05.22) prepared by Oculus.

1.1.2 A 24-month study undertaken by Sydney Catholic Schools has identified a major deficiency in the provision of affordable, non-government education within the North Sydney Local Government Area (LGA). The study also identified that the choice for families is extremely limited, as almost all of the schools in North Sydney provide single-sex education, with co-educational schools significantly underrepresented. Sydney Catholic Schools, as operators of St Mary's Catholic Primary School and Marist College North Shore, is responding to this challenge and has identified a strategic response that can positively support the future of North Sydney.

1.1.3 The purpose of this Report is to undertake a Visual Tree Assessment[1] (VTA), determine the impact of the proposed works on the trees, and where appropriate, recommend the use of sensitive construction methods and tree protection methods to minimise adverse impacts. The ecological and heritage significance of the trees has not been assessed and is beyond the scope of this Report.

1.1.4 In preparing this Report, the author has considered the objectives of the following:

- *State Environmental Planning Policy - Biodiversity and Conservation (2021)*
- *North Sydney Local Environmental Plan (2013)*
- *Section 16 to Part B of North Sydney Development Control Plan (2013)*
- *Australian Standard 4970 Protection of Trees on Development Sites (2009)*
- *Australian Standard 4373 Pruning of Amenity Trees (2007)*
- *Australian Standard 2303 Tree Stock for Landscape Use (2015)*
- *Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

Refer to Methodology **(Appendix 1)**

1.1.5 This impact assessment is based on an assessment of the following supplied documentation/plans only:

- Tree Management Plan – prepared by Oculus Plan L-005, Rev D, dated 13.05.22
- Existing & Demolition Plan – Ground Level (DA-010) – prepared by WMK, Issue A, dated 08.12.20
- Basement Plan (SK-020) – prepared by WMK, Issue P33, dated 16.11.20
- Ground Plan (SK-021) – prepared by WMK, Issue P33, dated 16.11.20
- Site Roof Plan (DA-021) – prepared by WMK, Issue A, dated 08.12.20
- GA Plan – Ground Zone 1 (DA-102) – prepared by WMK, Issue A, dated 08.12.20
- GA Plan – Ground Zone 2 (DA-103) – prepared by WMK, Issue A, dated 08.12.20
- Building Elevations (DA-210) – prepared by WMK, Issue A, dated 08.12.20
- Landscape Ground Plan (L200) – prepared by WMK, Issue A, dated 14.12.20

Refer to Plans **(Appendix 2)**

[1] Mattheck & Breloer (2003)



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

### 1.2 The Proposal

1.2.1 The SSD DA seeks approval for:

- Retention of key buildings including St Mary's Church and Parish Centre, the former Presbytery and Monastery, St Mary's Primary School and some existing buildings on the western boundary
- Demolition of existing buildings along Miller Street and Carlow Street, including the childcare centre and terrace houses
- Construction of a mixed-use education precinct comprising a high school and early learning centre, including:
  - adaptive reuse of the existing Presbytery, and alterations and additions to retained educational buildings
  - construction of a multistorey educational building on the corner of Miller Street and Carlow Street
  - construction of a multistorey mixed-use building along Miller Street, accommodating teaching facilities, an early learning centre and an auditorium
  - construction of a new basement car park; and
  - provision of ancillary canteen/café uses
- Landscaping and public domain works, including the creation of a new plaza along Miller Street, adjoining St Mary's Church

## 2.0 RESULTS

### 2.1 The Site

2.1.1 The site is located at 270 Miller Street, North Sydney within North Sydney LGA. It is bound by Carlow Street to the north, Ridge Street to the south, Miller Street to the east, and Ridge Lane to the west. The site is surrounded by a mix of civic, residential and commercial use buildings.

2.1.2 The site is approximately 700m north of the North Sydney CBD and located opposite St Leonards Park and North Sydney Oval. The site is strategically located between Crows Nest and North Sydney, which will soon be connected by the Sydney Metro. The site is approximately 250m to the north of the future Sydney Metro Station at the corner of Miller and McLaren Streets.

2.1.3 Existing development on the site includes St Mary's Primary School, Marist College North Shore, St Mary's Church and Parish Centre, the former Presbytery and Monastery, as well as the two (2) acquired terraces along Miller Street and a childcare centre known as the Jacaranda Centre.

2.1.4 The site comprises 26 lots and has a total area of 22,420m2.

Refer to Site Aerial **(Figure 1)**



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au


**Figure 1:** Showing site aerial

## 2.2 The Trees

2.2.1 Sixty-one (61) trees (and tree groups) were assessed using the Visual Tree Assessment[2] (VTA) criteria and notes. The trees comprise of a mix of locally indigenous, Australian-native and exotic species. Thirty-one (31) species are represented.

2.2.2 It is understood the trees at Marist Catholic College are assessed annually as part of their risk management program with many trees on site tagged. Trees numbers are consistent with the existing tree tag numbering system. Trees without tags have been prefixed with *tQ*.

2.2.3 An additional twenty-three (23) street trees have been addressed within this Report. Species and trunk diameter measurements were recorded for trees located outside of the site boundaries for the purposes of determining Tree Protection Zone (TPZ) calculations only.

[2] Mattheck & Breloer (2003)



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

2.2.4 A review of the 1943 aerial photograph of the site shows a small tree in a similar location to Tree tQ23 *Ficus macrophylla* (Moreton Bay Fig).[3]

2.2.5 None of the trees are listed in Schedule 5 *Environmental Heritage of the North Sydney Local Environmental Plan (2013)*.[4]

2.2.6 Tree tQ85 *Olea europaea* subsp. *Cuspidata* (African Olive) is listed as an exempt species within Section 16.2.2 P1 (j) of the *North Sydney Development Control Plan (2013).*

2.2.7 Tree tQ85 *Olea europaea* subsp. *Cuspidata* (African Olive) and Tree tQ66 *Cinnamomum camphora* (Camphor Laurel) are also subject to a *General Biosecurity Duty* by the Department of Primary Industries. In particular, the species *Olea europaea* subsp. *Cuspidata* (African Olive) must not be sold in NSW.[5]

2.2.8 Tree 27 was identified as *Eucalyptus nicholii* (Small Leaf Peppermint). This species is an Australian-native which naturally occurs in the New England Tableland on the NSW-Queensland border. *Eucalyptus nicholii* (Narrow Leaf Peppermint) is listed as *Vulnerable* under the NSW *Biodiversity Conservation Act (2016)* and the Commonwealth *Environment Protection & Biodiversity Conservation Act (1999*). However, this tree appears to be a planted specimen and is not a component of locally indigenous vegetation community.

2.2.9 As required by Clause 2.3.2 of *Australian Standard 4970 Protection of Trees on Development Sites (2009)*, each tree (and tree group) has been allocated a Retention Value. TreeiQ allocates one of four Retention Value categories based on a combination of Landscape Significance and Useful Life Expectancy (ULE). The assessment of Landscape Significance and ULE involves a degree of subjectivity and there will be a range of tree quality and value within each of the Retention Value categories. The Retention Values do not consider any proposed development works and are not a schedule for tree retention or removal. The trees (and tree groups) have been allocated one of the following Retention Values:

- Priority for Retention
- Consider for Retention
- Consider for Removal
- Priority for Removal

Refer to Tree Assessment Schedule **(Appendix 3)**

2.2.10 Table 1: Retention Values

| Priority for Retention | Consider for Retention | Consider for Removal | Priority for Removal |
|---|---|---|---|
| TQ23, TQ59 & TQ97 | 1, 8, 27, 30, 31, 32, TQ67, TQ68, TQ82, TQ86, TQ88, TQ93, TQ95 & TQ96 | TQ5, TQ6, 9, 10, TQ11, TQ16, TQ19, 20, 21, 28, 33, TQ39, TQ60, TQ61, TQ62, TQ63, TQ64, TQ65, TQ66, TQ69, TQ70, TQ71, TQ72, TQ73, TQ74, TQ75, TQ76, TQ77, TQ78, TQ79, TQ80, TQ81, TQ83, TQ84, TQ87, TQ89, TQ90, TQ91, TQ92, TQ94, TQ98 & TQ99 | TQ40 & TQ85 |

[3] NSW Government Spatial Services (2016)
[4] North Sydney Council (2013)
[5] Department of Primary Industries (2017)



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

## 3.0 ARBORICULTURAL IMPACT ASSESSMENT

### 3.1 Tree Removal

3.1.1 The supplied plans show that forty-five (45) trees and tree groups are to be removed as part of the proposed development. This includes one (1) tree with a Retention Value of *Priority for Retention*, seven (7) trees with a Retention Value of *Consider for Retention,* thirty-five (35) trees with a Retention Value of *Consider for Removal* and two (2) trees with a Retention Value of *Priority for Removal.*

3.1.2 Table 2: Tree Removal

| Priority for Retention | Consider for Retention | Consider for Removal | Priority for Removal |
|---|---|---|---|
| TQ23 | 27, 30, 31, 32, TQ93, TQ95 & TQ96 | TQ5, TQ6, 9, 10, TQ11, TQ16, TQ19, 20, 21, 28, 33, TQ39, TQ60, TQ61, TQ62, TQ63, TQ64, TQ65, TQ66, TQ70, TQ71, TQ72, TQ73, TQ74, TQ75, TQ76, TQ77, TQ78, TQ79, TQ81, TQ87, TQ92, TQ94, TQ98 & TQ99 | TQ40 & TQ85 |

3.1.3 An additional two (2) trees (Trees tQ49 & tQ51) which are located on the Miller Street road reserve are also proposed for removal.

3.1.4 Of the trees listed in Table 2, two (2) trees (tQ23 and tQ96) with a high Landscape Significance are proposed for removal. Arboricultural input was sought during the design development stage of the project in order to retain as many good quality trees as possible. However, it is understood that it was not possible to retain Tree 23 due to its internal location within the site and conflict with the proposed basement. In addition, due its spreading habit, a large percentage of the crown of Tree 96 would need to be pruned to accommodate the new building which would significantly impact its form.

### 3.2 Tree Transplanting

3.2.1 The supplied plans show that two (2) trees (Trees 8 & TQ86) are to be transplanted as part of the proposed development. These trees were identified as *Phoenix canariensis* (Canary Island Date Palm) which are generally suitable for transplanting due to their fibrous root system. However, numerous factors (such as time frame, financial costs, logistical constraints and heritage impacts) must be considered when determining the feasibility of transplanting. Prior to transplanting, Transplanting Feasibility Report and Method Statement should be prepared by an experienced Tree Transplanting Contractor.

### 3.3 Tree Retention

3.3.1 The supplied plans show that fourteen (14) trees and tree groups are to be retained as part of the proposed development. This includes two (2) trees with a Retention Value of *Priority for Retention*, five (5) trees with a Retention Value of *Consider for Retention* and seven (7) trees with a Retention Value of *Consider for Removal.*



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

3.3.2 Table 3: Retention Values

| Priority for Retention | Consider for Retention | Consider for Removal | Priority for Removal |
|---|---|---|---|
| tQ59 & tQ97 | 1, TQ67, TQ68, TQ82 & TQ88 | TQ69, TQ80, TQ83, TQ84, TQ89, TQ90 & TQ91 | |

3.3.3 An additional twenty-one (21) trees (Trees tQ24-tQ26, tQ29, tQ34, tQ35, tQ37, tQ38, tQ44-tQ48, tQ50, tQ52-tQ58) located outside of the site boundaries are also proposed for retention.

3.3.4 Works are proposed within the Tree Protection Zone (TPZ) areas of seventeen (17) trees as discussed below.

## 3.4 Minor Encroachment

3.4.1 The supplied plans show that works are proposed within the TPZ areas of Trees tQ26, tQ52, tQ53, tQ58, tQ82 and tQ97. As the encroachment into the individual TPZ is less than 10% and outside of the Structural Root Zone (SRZ), the extent of works represents *Minor Encroachments* as defined by *Australian Standard 4970-2009 Protection of Trees on Development Sites* (AS-4970). A *Minor Encroachment* is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ. The encroachments into TPZ areas should be compensated for by extending the TPZ in areas not subject to encroachment.

## 3.5 Major Encroachment

3.5.1 The supplied plans show that works are proposed with TPZ areas of TQ34, TQ35, TQ37, TQ54, TQ56, TQ58, TQ59, TQ67, TQ68, TQ69, TQ80 and TQ88. The extent of works represents *Major Encroachments* as defined by AS-4970 and are discussed in more detail below.

### 3.5.2 Pavement Installation

The supplied plans show pavement surfaces are proposed within the TPZ areas of Trees TQ54, TQ58, TQ59, TQ67, TQ68, TQ69, TQ80 and TQ88. New pavements should be designed and installed above existing grade (including any sub-base layers where required) with only minimal compaction of the sub-grade (i.e. pedestrian plate compactor only). Where existing pavements surfaces are to be replaced, the pavement can be installed at existing grade where the underlying subbase is retained and reused. Where roots are present within the existing subbase layer, the subbase and wearing surface should be locally modified as required to enable the retention of roots (>25mmø) as determined by the Project Arborist.

### 3.5.3 Bench Seating

The supplied plans show bench seating is proposed within the TPZ areas of Trees tQ54, tQ59, tQ67 and tQ68. The bench seating should be supported on isolated piered footings (with all other parts of the structures positioned above existing ground levels). Excavation for footings within the TPZ areas should be undertaken using tree sensitive methods (hand/hydrovac/airspade etc) and footing locations should be flexible and/or the footing design modified to enable the retention of roots (>25mmø) as required by the Project Arborist.

### 3.5.4 Garden Edging

The supplied plans show that garden edging is proposed within the within the TPZ areas of Trees tQ67-tQ69 and tQ80. The garden edging should be installed using hand excavation with the edging modified (cut away) as required to bridge over and enable the retention of roots (>25mmø) as determined by the Project Arborist. Pegs/pins to which the edging is affixed should be located as to avoid roots (>25mmø).



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

### 3.5.5 Basement

The supplied plans show the basement is proposed within the TPZ of Tree 56. However, as it falls within the footprint of the existing Block A building, the works are unlikely to have an adverse impact on the tree.

### 3.5.6 Ramp

The supplied plans show that a new ramp is proposed within the TPZ areas of Trees tQ34 and tQ35. The footing of the existing 2m high (approx.) boundary wall should have limited the root spread of the trees into the site. Therefore, the excavation associated with the installation of the ramp should not significantly impact the trees.

### 3.5.7 Substation, Ramp & Driveway Crossover

The supplied plans show that a substation, ramp and driveway is proposed within the TPZ of Tree 37. As an individual component of the works, the driveway crossover has been designed to represent a *Minor Encroachment* only. No over-excavation should be undertaken. The excavation associated with the installation of the substation and ramp should not significantly impact the tree as root spread from the tree into the site should be limited by the footing of the existing 2m high (approx.) boundary wall.

3.5.8 It should be noted that recent storm damage (December 2020) has resulted in the failure of a 300mm diameter first order branch which has created a large opening in the tree's crown and significantly impacted its form and amenity value. The Selective Pruning of 4x (>100mmø) branches will also be required to provide clearance from the proposed Student Service Building and to provide increased vertical clearance over the proposed driveway. The woody tissue of Liquidambars is relatively weak and anecdotally the species can be prone to storm damage. Where large openings in the crown of a tree are created (via storm damage or pruning), the altered wind loading forces may increase the likelihood for branch failures particularly in the short term as the tree adapts to altered mechanical loading. Although the proposed driveway crossover to the west of Tree 37 has been designed to represent a *Minor Encroachment* only, consideration should be given to the removal and replacement of this tree due to the recent storm damage and potential impacts from the pruning works.

## 3.6 Other Works within TPZ Areas

### 3.6.1 Demolition Works

Demolition works within TPZ areas should be supervised by the Project Arborist and utilise tree sensitive methods. Structures should be demolished in small sections ensuring demolition machinery/equipment does not contact with any part of the tree. Existing structures within the SRZ can contribute to tree stability by providing ballast to the rootplate or act as a stop to the overturning of the rootball and should be retained in-situ if possible.

### 3.6.2 Underground Services

Underground services should be located outside of the TPZ areas. Where this is not possible, services should be installed using tree sensitive excavation (hand/hydrovac/air spade) methods with the services located around/below roots (>25mmø) as required by the Project Arborist. Excavation using compact machinery fitted with a flat bladed bucket is permissible where approved by the Project Arborist. Excavation using compact machinery should be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).

3.6.3 Alternatively, boring methods may be used for underground service installation where the obvert level (highest interior level of pipe) is greater than 1200mm below existing grade. Excavations for starting and receiving pits for boring equipment should be located outside of the TPZ areas or located to avoid roots (>25mmø) as deemed necessary by the Project Arborist.



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

### 3.6.4 Landscaping

The installation of plants/turf within the TPZ should be undertaken using hand tools and roots (>25mmø) should be protected. No mechanical cultivation/ripping of soils should be undertaken within TPZ areas. Soil conditioners and turf underlay may be installed however should not increase existing soil levels within the TPZ by greater than 100mm and must not raise levels within 1m of the base of any tree.

## 3.7 Pruning

3.7.1 The supplied plans show that Trees tQ26, tQ34, tQ35, tQ37 and tQ97 will need to be pruned for building and vehicular clearance. Refer to Plates **(Appendix 4)**.

3.7.2 It should be noted that the assessment of pruning requirements was made from ground level with no set-out of the proposed footprints provided. During the construction phase of a project some additional minor pruning works may be required to provide building clearances and should be determined by the Project Arborist at the time of construction.

3.7.3 Provision should be made within the scaffolding design so that additional pruning is not required. Where additional clearance is required, branches may be temporarily pushed or tied back. Where branches cannot be pushed or tied back without damage, scaffolding/hoarding should be modified and constructed around branches (with appropriate branch protection installed as required). Deadwood greater 30mmø should be removed from the crowns of the trees in area with high value targets.

3.7.4 Pruning works should be carried out by a Practising Arborist. The Practising Arborist should hold a minimum qualification equivalent (using the Australian Qualifications Framework) of Level 3 or above, in Arboriculture or its recognised equivalent. The Practising Arborist should have a minimum of 3 years' experience in practical Arboriculture. Pruning work should be undertaken in accordance with *Australian Standard 4373: Pruning of Amenity Trees (2007), Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)* and other applicable legislation and codes.

## 3.8 Replacement Planting

3.8.1 The supplied plans show that approximately seventy-nine (79) trees are proposed to help off-set the loss of canopy cover and amenity resultant from the tree removal. Trees should be supplied as advanced size specimens (i.e. ≥ 75L) and in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*

3.8.2 New tree plantings should be supervised by Horticulturalists (AQF Level 3 or above in Horticulture) to ensure correct planting methods.

# 4.0 CONCLUSION

4.1.1 Eighty-four (84) trees and tree groups were addressed within this Report and comprise a mix of locally indigenous, Australian-native and exotic species. Of the sixty-one (61) trees within the site:

- Three (3) trees (5%) were allocated a Retention Value of *Priority for Retention*
- Fourteen (14) trees (23%) were allocated a Retention Value of *Consider for Retention*
- Forty-two (42) trees (69%) were allocated a Retention Value of *Consider for Removal*
- Two (2) trees (3%) were allocated a Retention Value of *Priority for Removal*



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

4.1.2 The SSD DA seeks approval for demolition of existing buildings, construction of a mixed-use education precinct, and landscaping and public domain works.

4.1.3 The supplied plans show that forty-seven (47) trees (Trees TQ5, TQ6, 9, 10, TQ11, TQ16, TQ19, 20, 21, TQ23, 27, 28, 30, 31, 32, 33, TQ39, TQ40, TQ49, TQ51, TQ60, TQ61, TQ62, TQ63, TQ64, TQ65, TQ66, TQ70, TQ71, TQ72, TQ73, TQ74, TQ75, TQ76, TQ77, TQ78, TQ79, TQ81, TQ85, TQ87, TQ92, TQ93, TQ94, TQ95, TQ96, TQ98 & TQ99) are proposed for removal as part of the works.

4.1.4 The supplied plans show that two (2) trees (Trees 8 & TQ86) are to be transplanted as part of the proposed development. Prior to transplanting, Transplanting Feasibility Report and Method Statement should be prepared by an experienced Tree Transplanting Contractor.

4.1.5 The supplied plans show that thirty-five (35) trees (Trees 1, TQ24, TQ25, TQ26, TQ29, TQ34, TQ35, TQ37, TQ38, TQ44, TQ45, TQ46, TQ47, TQ48, TQ50, TQ52, TQ53, TQ54, TQ55, TQ56, TQ57, TQ58, TQ59, TQ67, TQ68, TQ69, TQ80, TQ82, TQ83, TQ84, TQ88, TQ89, TQ90, TQ91 & TQ97) are proposed for retention as part of the works. Tree sensitive design and construction methods will be required for Trees TQ34, TQ35, TQ37, TQ54, TQ56, TQ58, TQ59, TQ67, TQ68, TQ69, TQ80, TQ88 and TQ97 to minimse adverse impacts. The trees should be protected as outlined within the Tree Protection Specification **(Appendix 5)** and Typical Protection Details **(Appendix 6).** In addition, the Project Arborist should review all Construction Certificate Plans, where works are proposed within the TPZ areas, to ensure no additional encroachments or impacts to the trees.

4.1.6 A number of trees of the same species and condition which are small is size were assessed as groups. One hundred and four (104) trees were addressed within this report when accounting for the individual trees contained within groups. Of these:

- Sixty-three (63) trees are to be removed
- Two (2) trees are to be transplanted
- Thirty-nine (39) trees are to retained

4.1.7 The supplied plans show that five (5) trees (Trees tQ26, tQ34, tQ35, tQ37 & tQ97) will need to be pruned for building and vehicular clearance. Pruning work should be undertaken in accordance with *Australian Standard 4373: Pruning of Amenity Trees (2007), Safe Work Australia Guide for Managing Risks of Tree Trimming and Removal Work (2016)*

4.1.8 The supplied plans show that approximately seventy-nine (79) trees are proposed to help off-set the loss of canopy cover and amenity resultant from the tree removal. Trees should be supplied in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use.*



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

## 5.0 LIMITATIONS& DISCLAIMER

TreeiQ takes care to obtain information from reliable sources. However, TreeiQ can neither guarantee nor be responsible for the accuracy of information provided by others. Plans, diagrams, graphs and photographs in this Arboricultural Report are visual aids only and are not necessarily to scale. This Report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction/ecological/heritage etc issues.

This Report has been prepared for exclusive use by the client. This Report shall not be used by others or for any other reason outside its intended target or without the prior written consent of TreeiQ. Unauthorised alteration or separate use of any section of the Report invalidates the Report.

Many factors may contribute to tree failure and cannot always be predicted. TreeiQ takes care to accurately assess tree health and structural condition. However, a tree's internal structural condition may not always correlate to visible external indicators. There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the trees or site may not arise in the future. Information contained in this report covers only the trees assessed and reflects the condition of the trees at the time of inspection. Additional information regarding the methodology used in the preparation of this Report is attached as Appendix 1. A comprehensive tree risk assessment and management plan for the trees is beyond the scope of this Report.

Reference should be made to any relevant legislation including Tree Management Controls. All recommendations contained within this Report are subject to approval from the relevant Consent Authority.



## 6.0 BIBLIOGRAPHY& REFERENCES

Barrell (1995), 'Pre-development Tree Assessments', in *Trees & Building Sites, Proceedings of an International Conference Held in the Interest of Developing a Scientific Basis for Managing Trees in Proximity to Buildings*, International Society of Arboriculture, Illinois, USA, pp. 132-142

Dunster J, Smiley T, Matheny N, Lilly S (2013), *Tree Risk Assessment Manual*, Champaign, Illinois, International Society of Arboriculture, USA

Mattheck & Breloer (1994), *The Body Language of Trees: A Handbook for Failure Analysis*, The Stationary Office, London

NSW Office of Environment and Heritage's Atlas of NSW Wildlife (2011), *BioNet Atlas of NSW Wildlife*

NSW Government Spatial Services (2016)
https://maps.six.nsw.gov.au/ - accessed April 2020

Standards Australia (2009), *Protection of Trees on Development Sites AS-4970*

Standards Australia (2007), *Pruning of Amenity Trees AS-4373*

Standards Australia (2015), *Tree Stock for Landscape Use AS-2303*



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

## 7.0 APPENDICES



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

## Appendix 1: Methodology

**1.1** **Site Inspection**: This report was determined as a result of a comprehensive site inspection during November 2019.

**1.2** **Visual Tree Assessment (VTA)**: The subject tree(s) was assessed using the Visual Tree Assessment criteria and notes as described in *The Body Language of Trees – A Handbook for Failure Analysis.*[6] The inspection was limited to a visual examination of the subject tree(s) from ground level only. The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic or tissue testing was undertaken as part of this assessment. Trees outside the subject site were assessed from the property boundaries only.

**1.3** **Tree Dimensions**: The dimensions of the subject tree(s) are approximate only.

**1.4** **Tree Locations:** The location of the subject tree(s) was determined from the supplied plans. Trees not shown on the supplied plans have been plotted in their **approximate location only.**

**1.5** **Trees & Development**: Tree Protection Zones, Tree Protection Measures and Sensitive Construction Methods for the subject tree were based on methods outlined in *Australian Standard 4970-2009 Protection of Trees on Development Sites*.

The *Tree Protection Zone* (TPZ) is described in AS-4970 as a combination of the root area and crown area requiring protection. It is an area isolated from construction disturbance, so that the tree remains viable.

The *Structural Root Zone* (SRZ) is described in AS-4970 as the area around the base of a tree required for the tree's stability in the ground. Severance of structural roots within the SRZ is not recommended as it may lead to the destabilisation and/or demise of the tree.

In some cases it may be possible to encroach into or make variations to the theoretical TPZ. A *Minor Encroachment* is less than 10% of the area of the TPZ and is outside the SRZ. The area lost to this encroachment should be compensated for elsewhere and contiguous with the TPZ. A *Major Encroachment* is greater than 10% of the TPZ or inside the SRZ. In this situation the Project Arborist must demonstrate that the tree would remain viable. This may require root investigation by non-destructive methods or the use of sensitive construction methods.

**1.6** **Tree Health**: The health of the subject tree(s) was rated as *Good*, *Fair* or *Poor* based on an assessment of the following factors:

I. Foliage size and colour
II. Pest and disease infestation
III. Extension growth
IV. Crown density
V. Deadwood size and volume
VI. Presence of epicormic growth

**1.7** **Tree Structural Condition**: The structural condition of the subject tree(s) was rated as *Good*, *Fair* or *Poor* based on an assessment of the following factors:

I. Assessment of branching structure
(i.e co-dominant/bark inclusions, crossing branches, branch taper, terminal loading, previous branch failures)
II. Visible evidence of structural defects or instability
(i.e root plate movement, wounds, decay, cavities, fungal brackets, adaptive growth)
III. Evidence of previous pruning or physical damage
(root severance/damage, lopping, flush-cutting, lions tailing, mechanical damage)

**1.8** **Useful Life Expectancy (ULE)**: The ULE is an estimate of the longevity of the subject tree(s) in its growing environment. The ULE is modified where necessary to take in consideration tree(s) health, structural condition and site suitability. The tree(s) has been allocated one of the following ULE categories (Modified from Barrell, 2001):

I. 40 years +
II. 15-40 years
III. 5-15 years
IV. Less than 5 years

[6] Mattheck & Breloer (2003)



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

**1.9** **Landscape Significance**: Landscape Significance was determined by assessing the combination of the cultural, environmental and aesthetic values of the subject tree(s). Whilst these values are subjective, a rating of high, moderate, low or insignificant has been allocated to the tree(s). This provides a relative value of the tree's Landscape Significance which may aid in determining its Retention Value. If the tree(s) can be categorized into more than one value, the higher value has been allocated.

| Landscape Significance | Description |
|---|---|
| Very High | The subject tree is listed as a Heritage Item under the *Local Environmental Plan* with a local or state level of significance. |
| | The subject tree is listed on Council's Significant Tree Register or meets the criteria for significance assessment of trees and/or landscapes by a suitably qualified professional. The criteria are based on general principles outlines in the Burra Charter and on criteria from the Register of the National Estate. |
| High | The subject tree creates a 'sense of place' or is considered 'landmark' tree. |
| | The subject tree is of cultural or historical importance or is widely known. |
| | The subject tree is a prominent specimen which forms part of the curtilage of a heritage item with a known or documented association with that item. |
| | The subject tree has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species for the site defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999). |
| | The subject tree is known to contain nesting hollows to a species scheduled as a Threatened or Vulnerable Species for the site as defined under the provisions of the NSW *Biodiversity Conservation Act (2016)* or the Commonwealth *Environmental Protection and Biodiversity Conservation Act* (1999). |
| | The subject tree is an excellent representative of the species in terms of aesthetic value. |
| | The subject tree is of significant size, scale or makes a significant contribution to the canopy cover of the locality. |
| Moderate | The subject tree makes a positive contribution to the visual character or amenity of the area. |
| | The subject tree provides a specific function such as screening or minimising the scale of a building. |
| | The subject tree is a good representative of the species in terms of aesthetic value. |
| Low | The subject tree is a known environmental weed species or is exempt under the provisions of the local Council's Tree Management Controls |
| | The subject tree makes little or no contribution to the amenity of the locality. |
| | The subject tree is a poor representative of the species in terms of aesthetic value. |

**1.10** **Retention Value**: Retention Value was based on the subject tree's Useful Life Expectancy and Landscape Significance. The Retention Value was modified where necessary to take in consideration the subject tree's health, structural condition and site suitability. The subject tree(s) has been allocated one of the following Retention Values:

I. Priority for Retention
II. Consider for Retention
III. Consider for Removal
IV. Priority for Removal

| ULE | | Landscape Significance | | | |
|---|---|---|---|---|---|
| | Very High | High | Moderate | Low | Insignificant |
| 40 years + | Priority for Retention | Priority for Retention | | Consider for Removal | Priority for Removal |
| 15-40 years | | Priority for Retention | Consider for Retention | | |
| 5-15 years | | Consider for Retention | | | |
| Less than 5 years | Consider for Removal | Priority for Removal | | | |

The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

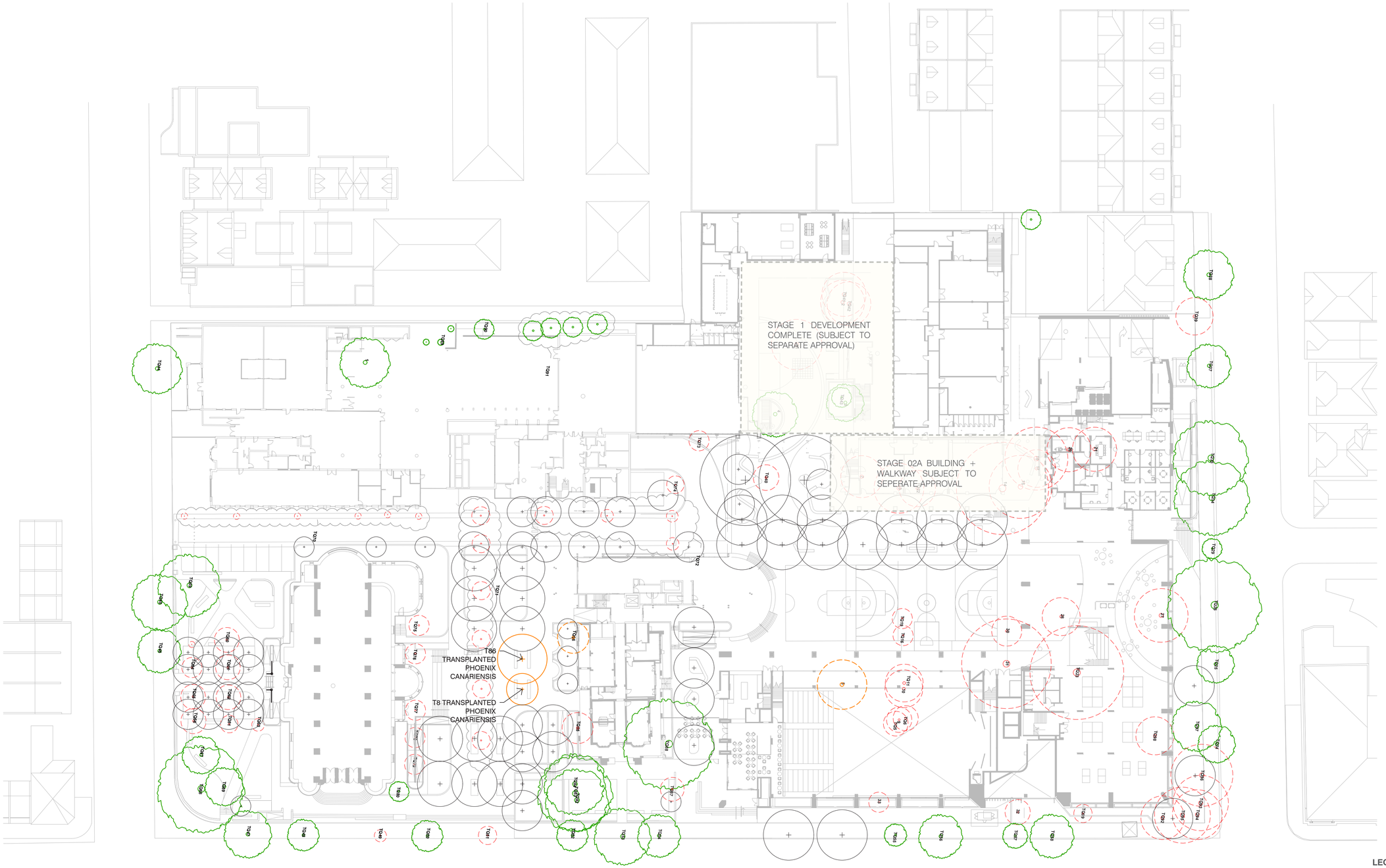
treeiQ.com.au

**Appendix 2: Plans**



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au




**LEGEND**

- Tree to be retained (44)
- Tree to be removed (63)
- Tree to be transplanted (2)
- Proposed Tree
- Transplanted Tree


O C U L U S
level 1, 5 wilson street / post box 307 newtown nsw 2042
p 02.9557.5533. f 02.9519.8323 mail@oculus.com.au

WMK

MARIST CATHOLIC COLLEGE NORTH SHORE
MARIST COLLEGE NORTH SHORE


| Date | Rev. Description | Rev |
|---|---|---|
| 21/12/20 | Issue for SSDA | A |
| 01/02/21 | Revised Issue for SSDA | B |
| 06/08/21 | Revised Issue for SSDA | C |
| 22/04/22 | Revised Issue for SSDA | D |

Marist College North Shore

Tree Management Plan

scale: 1:400@A1
job no.: S20-006
date: 13/05/22

drawn by: BJ/WW/RB
checked: KS

North

L - 005

D

Landscape Architect | Architect | Client | Revision table | Project | Drawing title | Drawing information | North | Drawing number | Rev.

9 DP1137247

DP574642

1 DP263032

MILLER STREET

RIDGE STREET

PAVED AREA

PAVED PATH

CONCRETE

1

TQ44

TQ45

TQ46

TQ47

TQ48

TQ49

TQ59

TQ60

TQ61

TQ62

TQ63

TQ64

TQ65

TQ66

TQ67

TQ68

TQ69

TQ70

TQ80

TQ81

TPZ

SRZ

0 1 2 3 4 5 6 7 8 9 10

SCALE 1:300

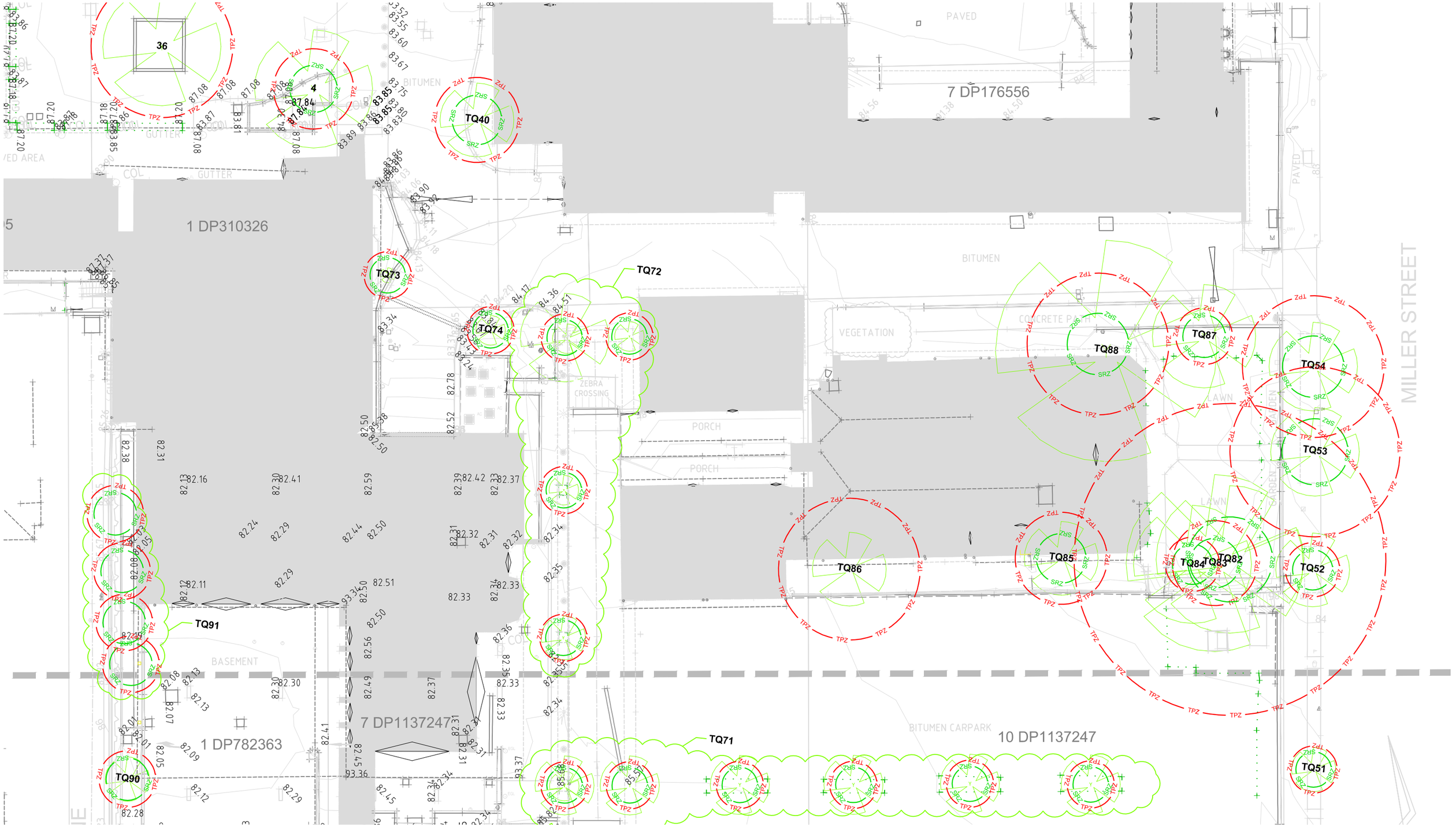
Legend

Tree Protection Zone

Structural Root Zone

Marist College North Sydney
Plan : TPZ & SRZ Plan
Sheet 1
Client: Sydney Catholic Schools Trust

treeiQ




0 1 2 3 4 5 6 7 8 9 10

SCALE 1:300

Legend

Tree Protection Zone

Structural Root Zone

Marist College North Sydney
Plan : TPZ & SRZ Plan
Sheet 2
Client: Sydney Catholic Schools Trust

treeiQ


0 1 2 3 4 5 6 7 8 9 10

SCALE 1:300

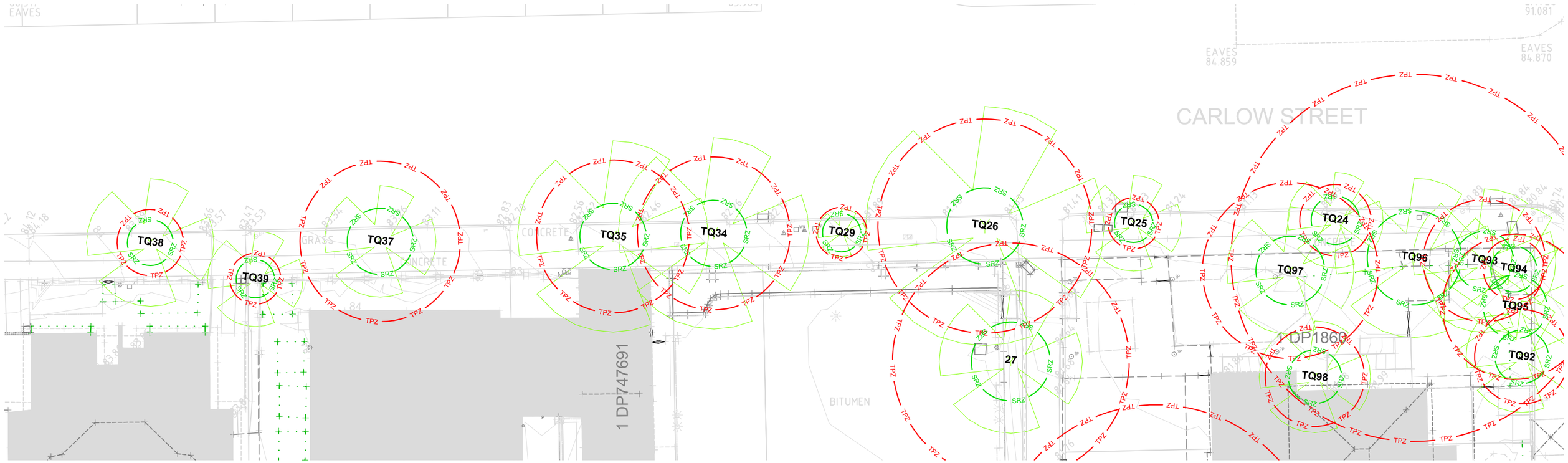
Legend

Tree Protection Zone

Structural Root Zone

Marist College North Sydney
Plan : TPZ & SRZ Plan
Sheet 3
Client: Sydney Catholic Schools Trust

treeiQ




0 1 2 3 4 5 6 7 8 9 10

SCALE 1:300

Legend

Tree Protection Zone

Structural Root Zone

Marist College North Sydney
Plan : TPZ & SRZ Plan
Sheet 4
Client: Sydney Catholic Schools Trust

treeiQ

**Appendix 3: Tree Assessment Schedule**

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Jacaranda mimosifolia* (Jacaranda) | 566 | 11 | 6 | Good | Fair | Braced. Small (<25mmø) & medium (25-75mmø) epicormic growth in moderate volumes. Lopped with resultant epicormics. Co-dominant inclusions, minor. Limited crown clearance. Structures within SRZ. | Mature | 15-40 | Moderate | Consider for Retention | Retain. No works within TPZ. | 6.8 | 2.7 |
| TQ5 | *Cyathea cooperi* (Scaly Tree Fern) | 75 | 8 | 3 | Good | Good | Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ6 | *Cyathea cooperi* (Scaly Tree Fern) | 75 | 4 | 3 | Good | Good | | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| 8 | *Phoenix canariensis* (Canary Island Date Palm) | 500 | 10 | 4 | Good | No access to base. No rating. | Structures within TPZ. | Mature | 15-40 | Moderate | Consider for Retention | Transplant. | 6.0 | 2.6 |
| 9 | *Xylosma japonicum* (Xylosma) | 214 | 5 | 3 | Good | Fair | Partially suppressed. Lopped with resultant epicormics. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.6 | 1.8 |
| 10 | *Syzygium* sp. (Lillypilly) | 168 | 4 | 4 | Good | Good | Wound(s), early signs of decay. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.6 |
| TQ11 | *Syzygium* sp. (Lillypilly) | 175 | 4 | 4 | Good | Good | Wound(s), early signs of decay. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.1 | 1.7 |
| TQ16 | *Xylosma japonicum* (Xylosma) | 200 | 4 | 3 | Good | Good | Small (<25mmø) epicormic growth in moderate volumes. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.4 | 1.8 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ19 | *Xylosma japonicum* (Xylosma) | 125 | 4 | 3 | Good | Good | Small (<25mmø) epicormic growth in moderate volumes. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| 20 | *Syzygium* sp. (Lillypilly) | 125 | 6 | 3 | Good | Good | Partially suppressed. Wound(s), no visible sign of decay. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| 21 | *Syzygium* sp. (Lillypilly) | 200 | 7 | 3 | Good | Good | Partially suppressed. Wound(s), no visible sign of decay. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.4 | 1.8 |
| TQ23 | *Ficus macrophylla* (Moreton Bay Fig) | 1063 | 12 | 10 | Good | Fair | Crown over buildings. Damaging bitumen Small (<25mmø) & medium (25-75mmø) epicormic growth in moderate volumes. Co-dominant inclusions, minor. Limited crown clearance. Structures within SRZ. | Mature | 15-40 | High | Priority for Retention | Remove. | 12.8 | 3.5 |
| TQ24 | *Stenocarpus sinuatus* (Firewheel Tree) | 236 | 7 | 4 | | | | | | | | Retain. No works within TPZ. | 2.8 | 1.9 |
| TQ25 | *Jacaranda mimosifolia* (Jacaranda) | 100 | 7 | 3 | | | | | | | | Retain. No works within TPZ. | 2.0 | 1.5 |
| TQ26 | *Liquidamber styraciflua* (Liquidamber) | 700 | 15 | 9 | | | | | | | | Retain. Minor encroachment, lobby entry stairs. | 8.4 | 3.0 |
| 27 | *Eucalyptus nicholii* (Small Leaved Peppermint) | 775 | 14 | 10 | Fair | Fair | Crown density 50-75%. Small (<25mmø) & large (>75mmø) deadwood in moderate volumes. Small (<25mmø) & large (>75mmø) epicormic growth in moderate volumes. Mechanical damage to exposed surface roots. Wound(s), early signs of decay. Structures within SRZ. | Late Mature | 5-15 | Moderate | Consider for Retention | Remove. | 9.3 | 3.1 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | *Agonis flexuosa* (Willow Myrtle) | 350 | 9 | 6 | Fair | Fair | Crown density 50-75%. Small (<25mmø) deadwood in moderate volumes. Co-dominant inclusions, major. Wound(s), early signs of decay. Structures within SRZ. | Late Mature | 5-15 | Low | Consider for Removal | Remove. | 4.2 | 2.2 |
| TQ29 | *Lagerstroemia indica* (Crepe Myrtle) | 75 | 4 | 2 | | | | | | | | Retain. No works within TPZ. | 2.0 | 1.5 |
| 30 | *Lophostemon confertus* (Brush Box) | 300 | 12 | 5 | Good | No access to base. No rating. | Wound(s), no visible sign of decay. Structures within SRZ. | Semi-mature | 5-15 | Moderate | Consider for Retention | Remove. | 3.6 | 2.1 |
| 31 | *Corymbia torelliana* (Cadaghi) | 800 | 16 | 11 | Good | Good | Crown over buildings. Crossing branches. Small (<25mmø) deadwood in low volumes. Structures within SRZ. | Mature | 15-40 | Moderate | Consider for Retention | Remove. | 9.6 | 3.1 |
| 32 | *Cupressus macrocarpa* (Monterey Cypress) | 500 | 14 | 5 | Good | Poor | Small (<25mmø) & medium (25-75mmø) deadwood in low volumes. Co-dominant inclusions, major. Bark inclusion(s), major. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Moderate | Consider for Retention | Remove. | 6.0 | 2.6 |
| 33 | *Xylosma japonicum* (Xylosma) | 200 | 4 | 5 | Good | Poor | Lopped with resultant epicormics. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.4 | 1.8 |
| TQ34 | *Liquidamber styraciflua* (Liquidamber) | 500 | 14 | 9 | | | | | | | | Retain. Major encroachment, ramp. Existing wall footing limits root spread into site. | 6.0 | 2.6 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ35 | *Liquidamber styraciflua* (Liquidamber) | 500 | 13 | 10 | | | | | | | | Retain. Major encroachment, ramp. Existing wall footing limits root spread into site. | 6.0 | 2.6 |
| TQ37 | *Liquidamber styraciflua* (Liquidamber) | 525 | 14 | 8 | | | | | | | | Retain. Major encroachment, substation & driveway crossover. Existing wall footing limits root spread into site. Driveway must clear SRZ. Recent storm damage - Dec 2020 | 6.3 | 2.6 |
| TQ38 | *Stenocarpus sinuatus* (Firewheel Tree) | 219 | 9 | 3 | | | | | | | | Retain. No works within TPZ. | 2.6 | 1.8 |
| TQ39 | *Callistemon viminalis* (Weeping Bottlebrush) | 71 | 4 | 2 | Good | Good | Group of 2 trees. Limited crown clearance. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ40 | *Waterhousia floribunda* (Weeping Lillypilly) | 300 | 4 | 4 | Fair | Poor | Cambium death on main trunk. Lopped with resultant epicormics. Limited crown clearance. Structures within SRZ. | Mature | <5 | Low | Priority for Removal | Remove. | 3.6 | 2.1 |
| TQ44 | *Platanus xacerifolia* (London Plane Tree) | 566 | 11 | 10 | | | | | | | | Retain. No works within TPZ. | 6.8 | 2.7 |
| TQ45 | *Lophostemon confertus* (Brush Box) | 750 | 13 | 9 | | | | | | | | Retain. No works within TPZ. | 9.0 | 3.1 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ46 | *Lophostemon confertus* (Brush Box) | 650 | 12 | 8 | | | | | | | | Retain. No works within TPZ. | 7.8 | 2.9 |
| TQ47 | *Platanus xacerifolia* (London Plane Tree) | 500 | 11 | 8 | | | | | | | | Retain. No works within TPZ. | 6.0 | 2.6 |
| TQ48 | *Platanus xacerifolia* (London Plane Tree) | 325 | 10 | 4 | | | | | | | | Retain. No works within TPZ. | 3.9 | 2.1 |
| TQ49 | *Platanus xacerifolia* (London Plane Tree) | 75 | 5 | 3 | | | | | | | | Remove. | 2.0 | 1.5 |
| TQ50 | *Platanus xacerifolia* (London Plane Tree) | 400 | 14 | 7 | | | | | | | | Retain. No works within TPZ. | 4.8 | 2.3 |
| TQ51 | *Platanus xacerifolia* (London Plane Tree) | 75 | 6 | 3 | | | | | | | | Remove. | 2.0 | 1.5 |
| TQ52 | *Platanus xacerifolia* (London Plane Tree) | 375 | 11 | 7 | | | | | | | | Retain. Minor encroachment, wall infill. | 4.5 | 2.3 |
| TQ53 | *Platanus xacerifolia* (London Plane Tree) | 600 | 14 | 10 | | | | | | | | Retain. Minor encroachment, wall infill. | 7.2 | 2.8 |
| TQ54 | *Platanus xacerifolia* (London Plane Tree) | 500 | 14 | 9 | | | | | | | | Retain. Major encroachment, pavement & bench seating. Use tree sensitive methods . | 6.0 | 2.6 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ55 | *Platanus xacerifolia* (London Plane Tree) | 50 | 4 | 2 | | | | | | | | Retain. No works within TPZ. | 2.0 | 1.5 |
| TQ56 | *Platanus xacerifolia* (London Plane Tree) | 700 | 13 | 10 | | | | | | | | Retain. Major encroachment, basement & building. Works within existing building footprint. | 8.4 | 3.0 |
| TQ57 | *Platanus xacerifolia* (London Plane Tree) | 100 | 8 | 4 | | | | | | | | Retain. No works within TPZ. | 2.0 | 1.5 |
| TQ58 | *Platanus xacerifolia* (London Plane Tree) | 650 | 14 | 9 | | | | | | | | Retain. Minor encroachment, basement. Major encroachment, pavement. Use tree sensitive methods. | 7.8 | 2.9 |
| TQ59 | *Ficus microcarpa* var. 'Hillii' (Hills Weeping Fig) | 850 | 12 | 8 | Fair | Fair | Crossing branches. Crown density 75-95%. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Mechanical damage to exposed surface roots. Co-dominant inclusions, major. Wound(s), advanced stages of decay. Structures within SRZ. | Mature | 15-40 | High | Priority for Retention | Retain. Major encroachment, pavement & bench seating. Use tree sensitive methods. | 10.2 | 3.2 |
| TQ60 | *Jacaranda mimosifolia* (Jacaranda) | 130 | 4 | 3 | Good | Good | Co-dominant inclusions, minor. Wound(s), no visible sign of decay. | Young | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ61 | *Acer* sp. (Maple) | 100 | 4 | 3 | Fair | Good | Localised crown death. Sun damage. Crown density 75-95%. Small (<25mmø) deadwood in moderate volumes. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ62 | *Acer* sp. (Maple) | 160 | 4 | 3 | Good | Poor | Small (<25mmø) deadwood in low volumes. Wound(s), advanced stages of decay. Trunk cavity(s), major. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.6 |
| TQ63 | *Jacaranda mimosifolia* (Jacaranda) | 130 | 4 | 3 | Good | Good | Co-dominant inclusions, minor. Wound(s), no visible sign of decay. | Young | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ64 | *Acer* sp. (Maple) | 160 | 4 | 3 | Good | Poor | Small (<25mmø) deadwood in low volumes. Wound(s), advanced stages of decay. Trunk cavity(s), major. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.6 |
| TQ65 | *Acer* sp. (Maple) | 160 | 4 | 3 | Poor | Poor | Localised crown death. Sun damage. Crown density 75-95%. Small (<25mmø) deadwood in moderate volumes. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.6 |
| TQ66 | *Cinnamomum camphora* (Camphor Laurel) | 125 | 7 | 3 | Good | Good | | Young | 15-40 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ67 | *Podocarpus elatus* (Brown Pine) | 361 | 12 | 5 | Good | Poor | Mechanical damage to exposed surface roots. Co-dominant inclusions, major. Wound(s), advanced stages of decay. | Mature | 5-15 | Moderate | Consider for Retention | Retain. Major encroachment, pavement, bench seating & garden edging. Use tree sensitive methods. | 4.3 | 2.2 |
| TQ68 | *Cedrus atlantica* (Atlantic Cedar) | 700 | 14 | 10 | Poor | Good | Crown density 50-75%. Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in high volumes. Wound(s), early signs of decay. Limited crown clearance. | Late Mature | 5-15 | Moderate | Consider for Retention | Retain. Major encroachment, pavement, bench seating & garden edging. Use tree sensitive methods. | 8.4 | 3.0 |

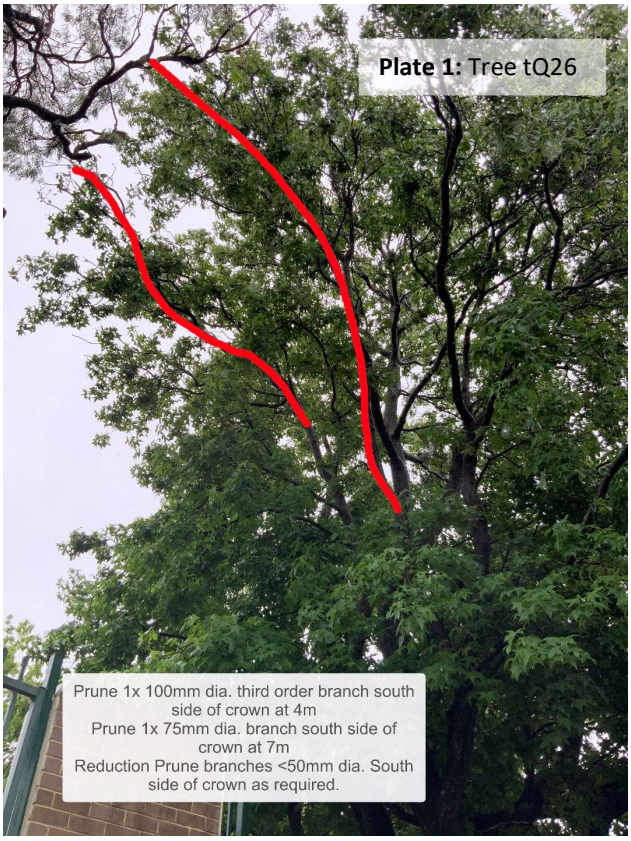
| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ69 | *Podocarpus elatus* (Brown Pine) | 350 | 7 | 3 | Good | Poor | Heavily suppressed. Mechanical damage to exposed surface roots. Co-dominant inclusions, major. | Semi-mature | 5-15 | Low | Consider for Removal | Retain. Major encroachment, pavement & garden edging. Use tree sensitive methods. | 4.2 | 2.2 |
| TQ70 | *Ulmus* sp. (Elm) | 50 | 4 | 1 | Dormant. No rating. | Good | Group of 5 trees. Limited crown clearance. Structures within SRZ. | Young | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ71 | *Ulmus* sp. (Elm) | 75 | 4 | 2 | Dormant. No rating. | Good | Group of 6 trees. Wound(s), no visible sign of decay. Structures within SRZ. | Young | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ72 | *Ulmus* sp. (Elm) | 75 | 4 | 2 | Dormant. No rating. | Good | Group of 4 trees. Wound(s), no visible sign of decay. Structures within SRZ. | Young | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ73 | *Ulmus* sp. (Elm) | 100 | 7 | 4 | Dormant. No rating. | Good | Small (<25mmø) epicormic growth in low volumes. Limited crown clearance. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ74 | *Cupressus sempervirens* (Italian Cypress) | 100 | 7 | 1 | Good | No access to base. No rating. | Group of 3 trees. Limited crown clearance. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ75 | *Acer* sp. (Maple) | 100 | 4 | 3 | Good | Good | Limited crown clearance. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ76 | *Acer* sp. (Maple) | 75 | 3 | 3 | Good | Good | Lopped with resultant epicormics. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ77 | *Acer* sp. (Maple) | 100 | 4 | 3 | Good | Good | Wound(s), early signs of decay. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |

| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ78 | *Acer* sp. (Maple) | 125 | 3 | 3 | Good | Good | Wound(s), early signs of decay. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ79 | *Acer* sp. (Maple) | 125 | 4 | 3 | Good | Good | | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ80 | *Tibouchina granulosa* (Purple Glory Bush) | 135 | 5 | 2 | Good | No access to base. No rating. | Group of 2 trees. Crown conflict with adjacent structures. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Retain. Major encroachment, pavement & garden edging. Use tree sensitive methods. | 2.0 | 1.5 |
| TQ81 | *Tibouchina granulosa* (Purple Glory Bush) | 135 | 5 | 2 | Good | No access to base. No rating. | Group of 2 trees. Crown conflict with adjacent structures. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |
| TQ82 | *Cupressus macrocarpa* 'Aurea' (Golden Cypress) | 1100 | 14 | 8 | Fair | Poor | Crown density 50-75%. Small (<25mmø) & medium (25-75mmø) deadwood in high volumes. Co-dominant inclusions, major. Wound(s), advanced stages of decay. | Late Mature | 15-40 | Moderate | Consider for Retention | Retain. Minor encroachment, wall infill. | 13.2 | 3.6 |
| TQ83 | *Syzygium* sp. (Lillypilly) | 300 | 6 | 3 | Fair | Poor | Localised crown death. Crown density 50-75%. Heavily suppressed. Co-dominant inclusions, major. Wound(s), advanced stages of decay. | Late Mature | 5-15 | Low | Consider for Removal | Retain. No works within TPZ. | 3.6 | 2.1 |
| TQ84 | *Michelia figo* (Port Wine Magnolia) | 189 | 5 | 3 | Good | Fair | Congested branches. Medium (25-75mmø) epicormic growth in moderate volumes. Heavily suppressed. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Retain. No works within TPZ. | 2.3 | 1.7 |
| TQ85 | *Olea europea* subsp. *cuspidata* (African Olive) | 325 | 11 | 8 | Good | Good | Crown density 75-95%. Limited crown clearance. Structures within SRZ. Phototrophic lean, slight. | Mature | 5-15 | Low | Priority for Removal | Remove. | 3.9 | 2.1 |

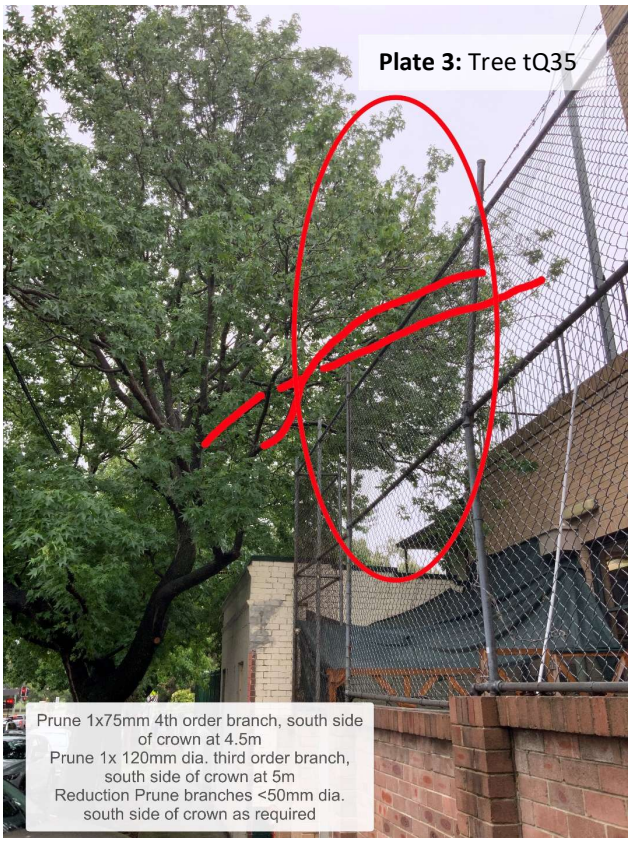
| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ86 | *Phoenix canariensis* (Canary Island Date Palm) | 575 | 10 | 5 | Good | No access to base. No rating. | Crown conflict with adjacent structures. Structures within SRZ. | Mature | 15-40 | Moderate | Consider for Retention | Transplant. | 6.9 | 2.7 |
| TQ87 | *Pittosporum undulatum* (Native Daphne) | 200 | 11 | 4 | Good | No access to base. No rating. | Partially suppressed. Previously crown lifted. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 2.4 | 1.8 |
| TQ88 | *Syzygium* sp. (Lillypilly) | 500 | 12 | 7 | Good | Good | Crown density 75-95%. Previously crown lifted. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Moderate | Consider for Retention | Retain. Major encroachment, pavement. | 6.0 | 2.6 |
| TQ89 | *Tristaniopsis laurina* (Water Gum) | 75 | 4 | 2 | Good | Good | Group of 3 trees. Limited crown clearance. Structures within SRZ. | Young | 5-15 | Low | Consider for Removal | Retain. No works within TPZ. | 2.0 | 1.5 |
| TQ90 | *Cupaniopsis anacardiodes* (Tuckeroo) | 200 | 5 | 3 | Fair | Good | Crown density 75-95%. Limited crown clearance. Structures within SRZ. | Semi-mature | 5-15 | Low | Consider for Removal | Retain. No works within TPZ. | 2.4 | 1.8 |
| TQ91 | *Cupaniopsis anacardiodes* (Tuckeroo) | 200 | 4 | 3 | Fair | Good | Group of 2 trees. Limited crown clearance. Structures within SRZ. Restricted soil volume. Chlorotic foliage. | Semi-mature | 5-15 | Low | Consider for Removal | Retain. No works within TPZ. | 2.4 | 1.8 |
| TQ92 | *Melia azedarach* (White Cedar) | 309 | 9 | 7 | Good | Fair | Partially suppressed. Co-dominant inclusions, major. Limited crown clearance. Structures within SRZ. | Mature | 5-15 | Low | Consider for Removal | Remove. | 3.7 | 2.1 |
| TQ93 | *Alnus jorullensis* (Evergreen Alder) | 400 | 13 | 7 | Fair | No access to base. No rating. | Crown density 50-75%. Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in moderate volumes. Small (<25mmø) & medium (25-75mmø) epicormic growth in moderate volumes. Trunk conflict with adjacent structures. Structures within SRZ. | Mature | 5-15 | Moderate | Consider for Retention | Remove. | 4.8 | 2.3 |

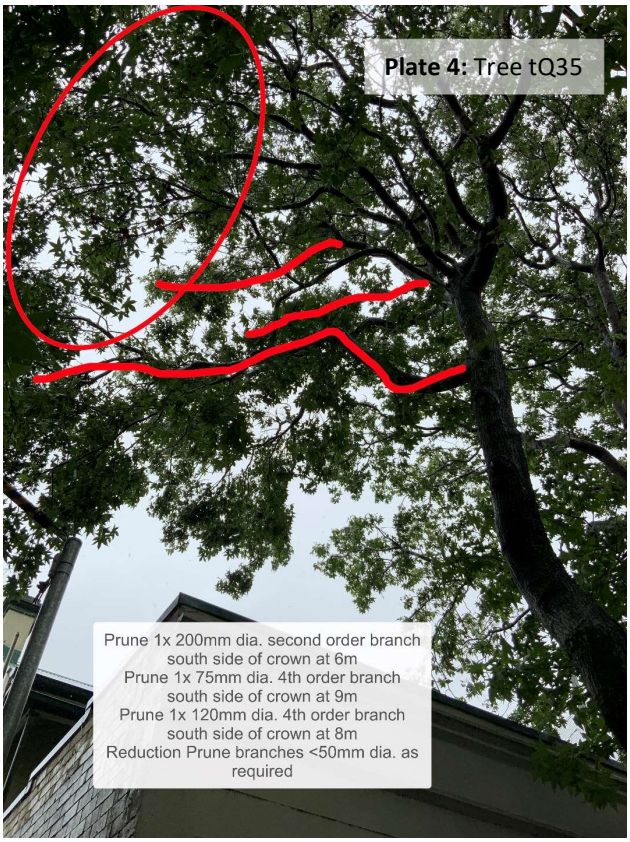
| Tree No. | Species | DBH comb. (mm) | Height (m) | Radial Crown Spread (m) | Health Rating | Structural Condition Rating | Comments | Age Class | ULE (years) | L/Sign | Retention Value | Implication | Radial TPZ (m) | Radial SRZ (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TQ94 | *Plumeria rubra* (Frangipani) | 200 | 3 | 2 | Dormant. No rating. | No access to base. No rating. | Not prescribed. | Semi-mature | 5-15 | Low | Consider for Removal | Remove. | 2.4 | 1.8 |
| TQ95 | *Alnus jorullensis* (Evergreen Alder) | 475 | 14 | 9 | Good | Good | Wound(s), early signs of decay. Structures within SRZ. | Mature | 15-40 | Moderate | Consider for Retention | Remove. | 5.7 | 2.5 |
| TQ96 | *Jacaranda mimosifolia* (Jacaranda) | 1200 | 14 | 11 | Dormant. No rating. | Fair | Small (<25mmø), medium (25-75mmø) & large (>75mmø) deadwood in low volumes. Small (<25mmø) & medium (25-75mmø) epicormic growth in moderate volumes. Co-dominant inclusions, major. Wound(s), advanced stages of decay. Trunk cavity(s), major. Structures within SRZ. | Mature | 5-15 | High | Consider for Retention | Remove. | 14.4 | 3.7 |
| TQ97 | *Eucalyptus microcorys* (Tallowwood) | 575 | 16 | 11 | Fair | Good | Lost central leader. Crown density 75-95%. Small (<25mmø) & medium (25-75mmø) deadwood in moderate volumes. Small (<25mmø), medium (25-75mmø) & large (>75mmø) epicormic growth in moderate volumes. Structures within SRZ. | Mature | 15-40 | High | Priority for Retention | Retain. Minor encroachment, basement & building. Provide irrigation. | 6.9 | 2.7 |
| TQ98 | *Plumeria rubra* (Frangipani) | 325 | 9 | 7 | Dormant. No rating. | Good | Wound(s), early signs of decay. Limited crown clearance. Structures within SRZ. | Late Mature | 5-15 | Low | Consider for Removal | Remove. | 3.9 | 2.1 |
| TQ99 | *Tristaniopsis laurina* (Water Gum) | 75 | 4 | 3 | Good | No access to base. No rating. | Limited crown clearance. Structures within SRZ. | Young | 5-15 | Low | Consider for Removal | Remove. | 2.0 | 1.5 |

## Appendix 4: Plates







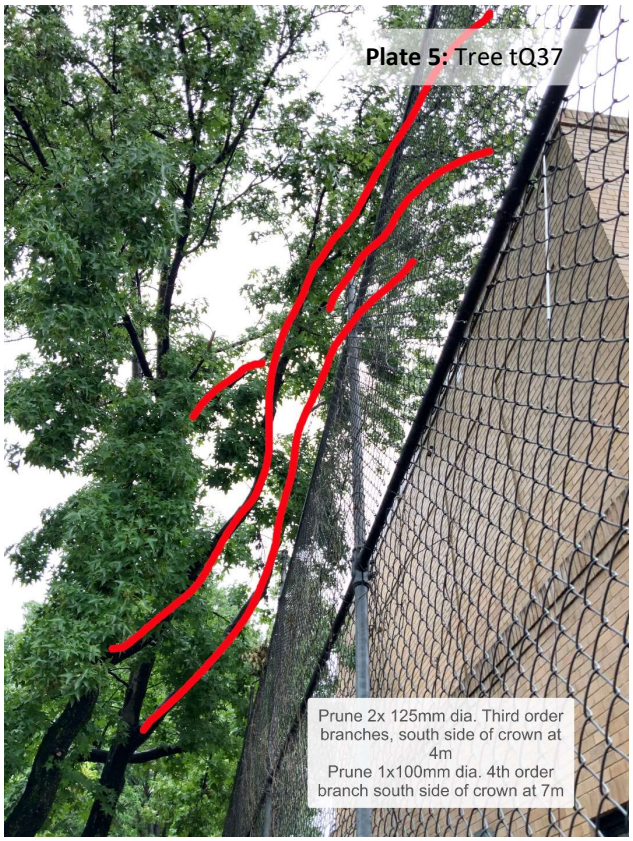


Plate 5: Tree tQ37
Prune 2x 125mm dia. Third order branches, south side of crown at 4m
Prune 1x100mm dia. 4th order branch south side of crown at 7m

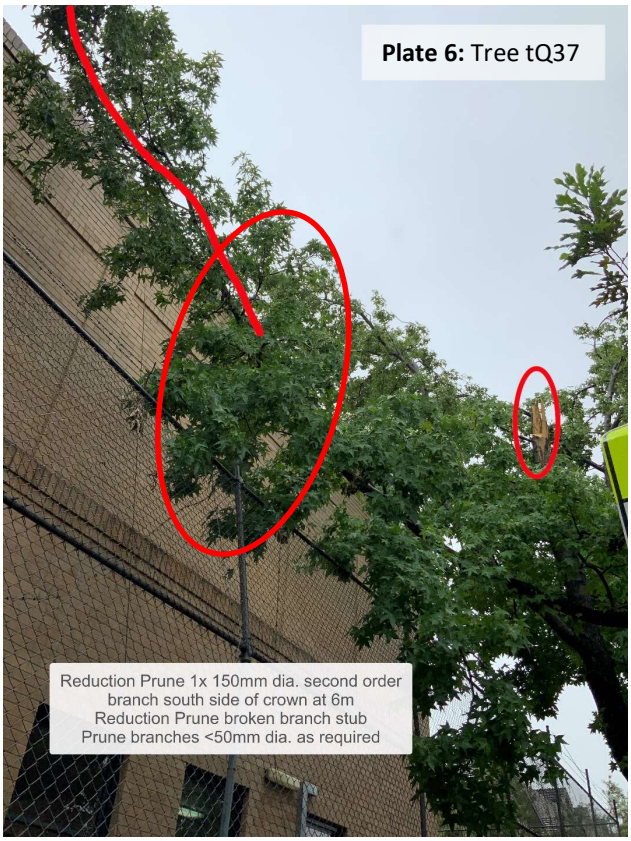


Plate 6: Tree tQ37
Reduction Prune 1x 150mm dia. second order branch south side of crown at 6m
Reduction Prune broken branch stub
Prune branches <50mm dia. as required


Plate 7: Tree tQ37
Crown Lift 2x 50mm dia. third ad fourth order branches, west side of crown at 4m and 4.5m

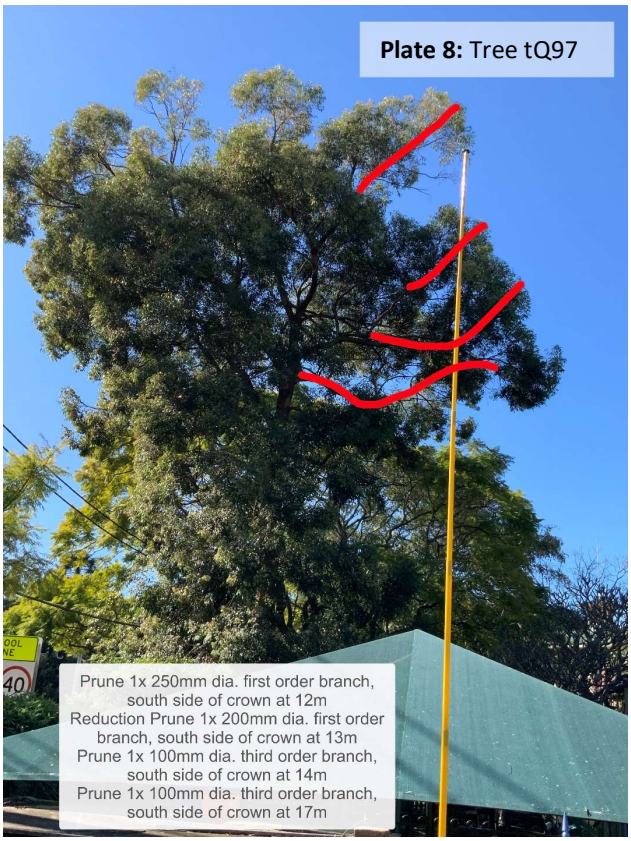


Plate 8: Tree tQ97
Prune 1x 250mm dia. first order branch, south side of crown at 12m
Reduction Prune 1x 200mm dia. first order branch, south side of crown at 13m
Prune 1x 100mm dia. third order branch, south side of crown at 14m
Prune 1x 100mm dia. third order branch, south side of crown at 17m

## Appendix 5: Tree Protection Specification

### 1.0 Appointment of Project Arborist

A Project Arborist shall be engaged prior the commencement of work on-site and monitor compliance with the protection measures. The Project Arborist shall inspect the tree protection measures and Compliance Certification shall be prepared by the Project Arborist for review by the Principal Certifying Authority prior to the release of the Compliance Certificate.

The Project Arborist shall have a minimum qualification equivalent (using the Australian Qualifications Framework) of NSW TAFE Certificate Level 5 or above in Arboriculture.

The site-specific requirement for mulching, irrigation, the location of tree protection fencing and temporary access, and other specific tree protection measures shall be confirmed through consultation between the Head Contractor/Project Manager and the Project Arborist prior to the commencement of works.

### 1.1 Compliance

Contractors and site workers shall receive a copy of these specifications a minimum of 3 working days prior to commencing work on-site. Contractors and site workers undertaking works within the Tree Protection Zone shall sign the site log confirming they have read and understand these specifications, prior to undertaking works on-site.

### 1.2 Tree Protection Zone

The tree to be retained shall be protected prior and during construction from activities that may result in an adverse effect on their health or structural condition. The area within the Tree Protection Zone (TPZ) shall exclude the following activities, unless otherwise stated:

- Modification of existing soil levels, excavations and trenching
- Mechanical removal of vegetation
- Movement of natural rock
- Storage of materials, plant or equipment or erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials, refueling or disposal of waste materials and chemicals
- Lighting fires
- Movement of pedestrian or vehicular traffic
- Temporary or permanent location of services, or the works required for their installation
- Any other activities that may cause damage to the tree

NOTE: If access, encroachment or incursion into the TPZ is deemed essential, prior authorisation is required by the Project Arborist.

### 1.3 Tree Protection Fencing

TPZ fencing shall be installed at the perimeter of the TPZ. The exact location of the fencing shall be confirmed through consultation between the Head Contractor/Project Manager and the Project Arborist prior to the commencement of works. Fencing may be setback to allow for demolition/construction access and for the installation of pavements only where appropriate ground protection is installed and approved by the Project Arborist.

As a minimum, the Tree Protection Fence shall consist of 1.8m high wire mesh panels supported by concrete feet. Panels shall be fastened together and supported to prevent sideways movement. The tree shall not be damaged during the installation of the Tree Protection Fencing. Refer to Typical Tree Protection Details (3) **(Appendix 6)**.

### 1.4 Signage

Signs identifying the TPZ should be placed around the edge of the TPZ and be visible from within the development site. The lettering on the sign should comply with *Australian Standard - 1319 (1994) Safety signs for the occupational environment*. The signage shall be installed prior to the commencement of works on-site and shall be maintained in good condition for the duration of the development period.

### 1.5 Site Management

Materials, waste storage, and temporary services shall not be located within the TPZ.



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

### 1.6 Trunk Protection

Trunk protection shall be installed as required by the Project Arborist. Trunk protection shall be installed by wrapping padding (either carpet underlay or 10mm thick jute geotextile mat) around the trunk and first order branches to a minimum height of 2m. Timber battens (90 x 45mm) spaced at 150mm centres shall be strapped together and placed over the padding. Timber battens must not be fixed to the trees. Refer to Typical Tree Protection Details (3) **(Appendix 6)**.

Branch protection shall be installed as deemed necessary by the Project Arborist.

### 1.7 Ground Protection

Pedestrian, vehicular and machinery access within a TPZ shall be restricted to areas of existing pavement or from areas of temporary ground protection such as ground mats or steel road plates. Refer to Typical Tree Protection Details (3) **(Appendix 6).**

### 1.8 Works within the Tree Protection Zones

In some cases works within the TPZ may be authorized by the determining authority. **These works shall be supervised by the Project Arborist**. When undertaking works within the TPZ, care should be taken to avoid damage to the tree's root system, trunks and lower branches.

If roots (>25mmø) are encountered during the demolition, excavation and construction works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Adjustment of final levels and design shall remain flexible to enable the retention of roots (>25mmø) where deemed necessary by the Project Arborist.

### 1.9 Structure & Pavement Demolition

Demolition of existing structures/pavement within the TPZ shall be supervised by the Project Arborist. Machinery is to be excluded from the TPZ unless operating from the existing slabs, pavements or areas of ground protection (refer to Section 1.7). Machinery shall work in conjunction with a spotter to guide the machinery operator and ensure that the ground surface/tree roots beneath the structure/pavement are not disturbed/damaged by demolition works. Machinery should not contact any part of a tree. Wherever possible, footings or elements below grade shall be retained to minimise disturbance to roots.

Small structures to be demolished within a TPZ shall be carefully broken up in small sections using a hand-operated pneumatic/electric breaker and waste material removed by hand/hand tools. Large structures to be demolished within the TPZ shall be undertaken within the footprint of the existing structure ('top down, pull back') and away from the trees.

When removing slab/pavement sections within TPZ, machinery shall work backwards out of the TPZ to ensure machinery remains on un-demolished sections of slab at all times. Existing sub-base materials within a TPZ shall remain in-situ and (and reused) where possible. If the existing sub-base is to be removed, these works shall be undertaken by hand/hand tools ensuring that tree roots are retained and protected.

If roots (>25mmø) are encountered during the demolition works, these roots must be retained in an undamaged condition and advice sought from the Project Arborist. Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute geotextile fabric. The geotextile fabric shall be kept in a damp condition at all times. Where the Project Arborist determines that the tree is using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

### 1.10 Underground Services

The installation of underground services shall be located outside of the TPZ. Where this is not possible, they shall be installed using tree sensitive excavation methods (hand/hydrovac/airspade) with the services installed around/below roots (>25mmø) or as required by the Project Arborist. Excavation using compact machinery (<2t) fitted with a flat bladed bucket is permissible where approved by the Project Arborist. Excavation using compact machinery should be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au

Alternatively, boring methods may be used for underground service installation where the obvert level (highest interior level of pipe) is greater than 1200mm below existing grade. Excavations for starting and receiving pits for boring equipment shall be located outside of the TPZ areas or located to avoid roots (>25mmø) as deemed necessary by the Project Arborist.

Drilling/piling machinery shall be excluded from the TPZ unless operating from an area where ground protection has been installed (refer to Section 1.7) or from the existing slabs or pavements. Drilling/piling machinery shall be of a suitable size to not damage the trees' roots, trunk, branches and crown. No clearance pruning is permitted to allow for machinery access. Machinery shall work in conjunction with an observer to ensure that adequate clearance from trees is maintained at all times

### 1.11 Plant/Turf Installation

Plant installation within TPZ areas shall be undertaken using hand tools and roots (>25mmø) shall be protected. No mechanical cultivation/ripping of soils shall be undertaken within TPZ areas.

Landscape planting shall be completed in the final stage of the development works and tree protection fencing and trunk protection shall remain in place until these works are due to commence.

### 1.12 Excavations, Root Protection & Root Pruning

All excavation works (including root investigations) within TPZ areas shall supervised by the Project Arborist and utilise tree sensitive methods. These methods include hand, airspade or hydrovac excavation. Where approved by the Project Arborist, excavation using compact machinery fitted with a flat bladed bucket is permissible. Unless specified otherwise, excavation using compact machinery (<2t) shall be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mmø).

Exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat, followed by a layer of plastic membrane. Coverings shall be weighted to secure them in place. The mat shall be kept in a damp condition at all times.

**No over-excavation, battering or benching shall be undertaken beyond the footprint of any structure unless approved by the Project Arborist.** Hand excavation and root pruning shall be undertaken along the excavation line prior to the commencement of mechanical excavation to prevent tearing and shattering damage to the roots from excavation equipment.

Roots (>25mmø) shall be pruned by the Project Arborist only. Roots (<25mmø) may be pruned by the Principal Contractor. Root pruning shall be undertaken with clean, sharp secateurs or a pruning saw to ensure a smooth wound face, free from tears. Damaged roots shall be pruned behind the damaged tissues with the final cut made to an undamaged part of the root.



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

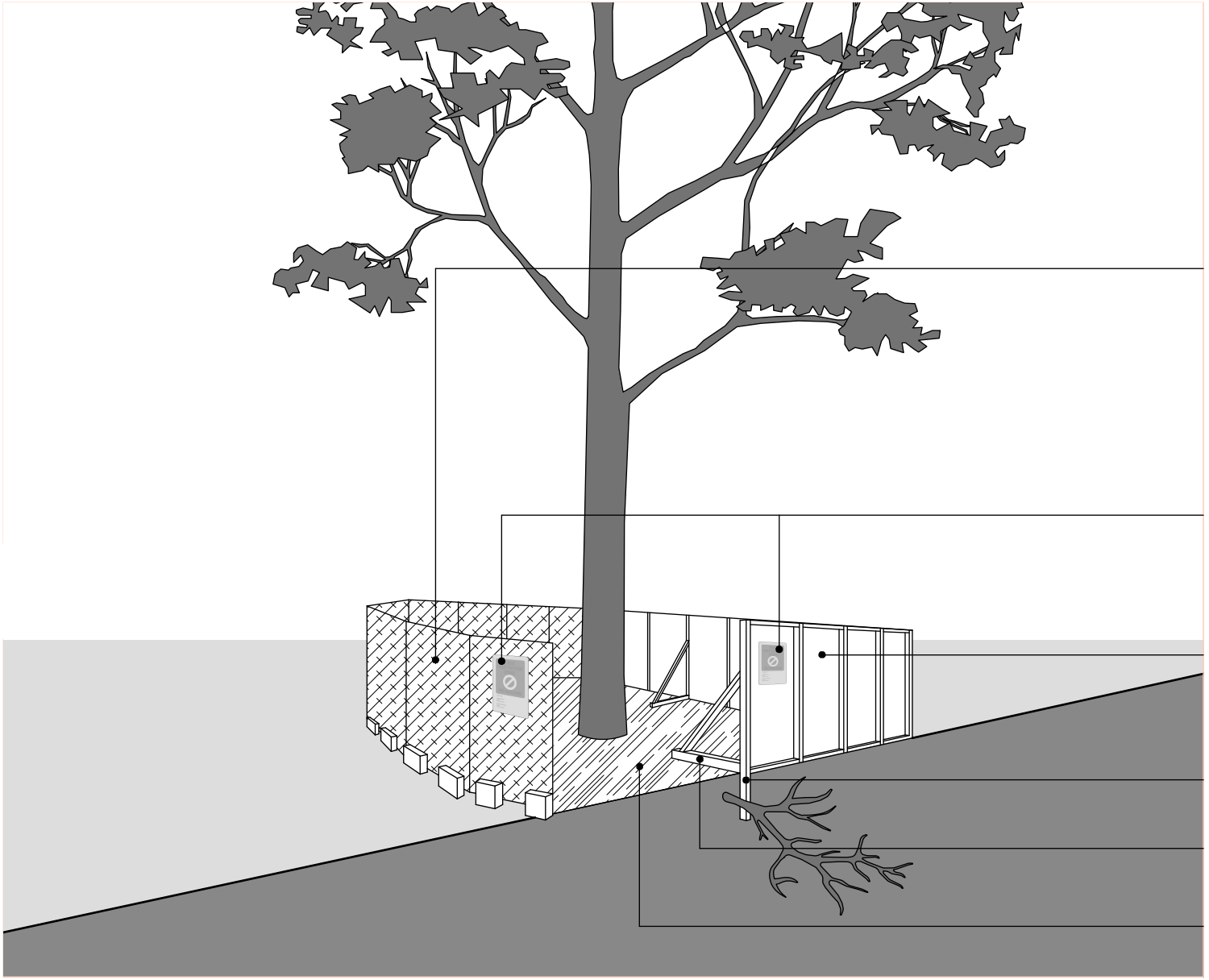
treeiQ.com.au

**Appendix 6: Typical Tree Protection Details**



p. 0404 424 264 | f. 02 9012 0924
po box 146 summer hill 2130
info@treeiQ.com.au
abn 62 139 088 832

treeiQ.com.au



**Note:**
No excavation, construction activity, grade changes, surface treatment or storage of materials of any kind is permitted within the TPZ.

**Option 1 - Fencing**
1.8m high chain wire mesh panels with shade cloth attached (if required), held in place with concrete feet.

Tree Protection Zone (TPZ) sign

**Option 2 - Fencing**
Plywood or wooden panel paling fence. This type of fencing material also prevents building materials or soil entering the TPZ.

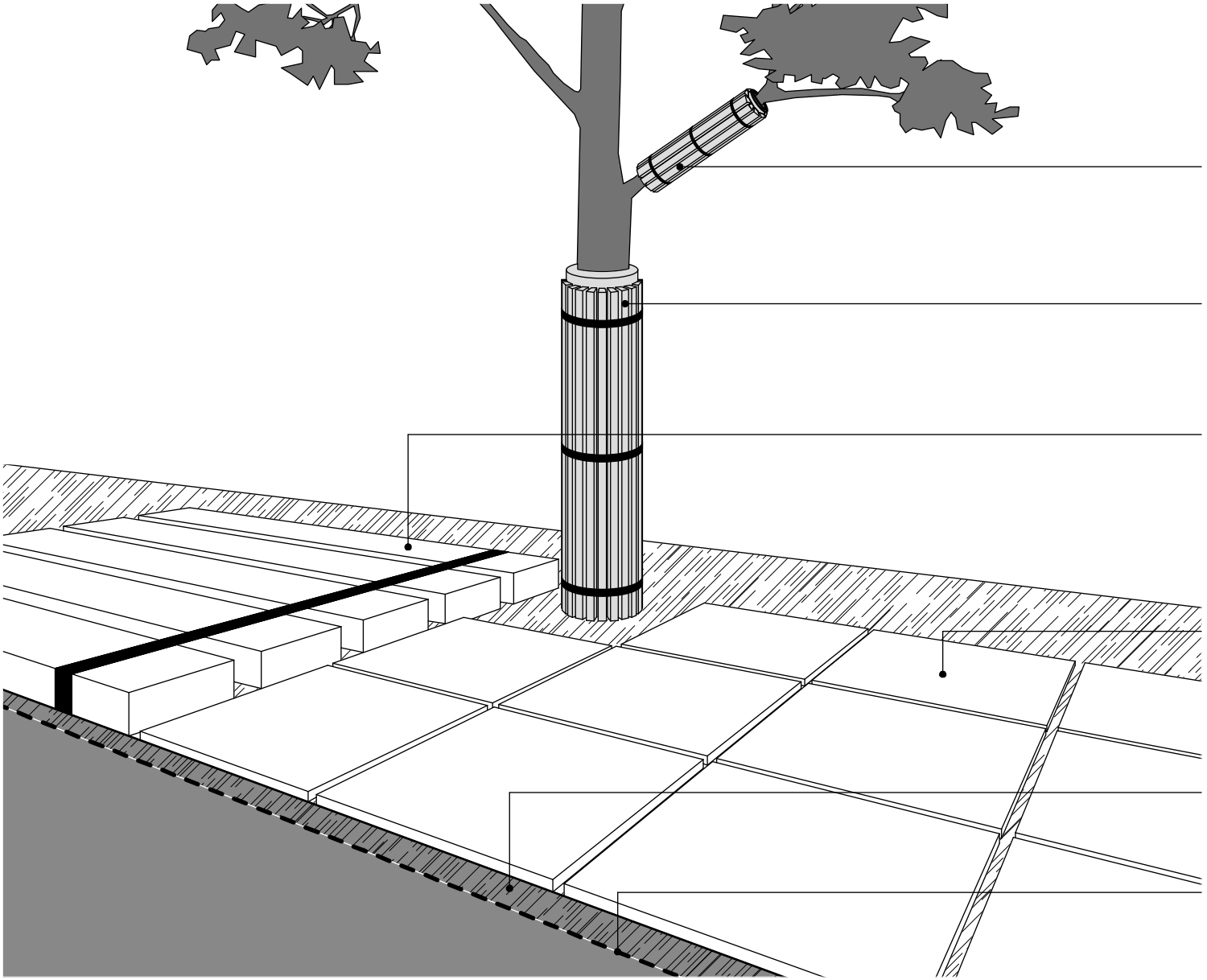
Installation of supports should avoid damaging roots.

Bracing is permissible within the TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer installed across surface of TPZ.

03 Tree Protection Fencing

Not to Scale



**Branch Protection** - use boards and padding to prevent damage to bark on branch. Boards are to be strapped, not screwed or nailed to the branch.

**Trunk Protection** - use boards and padding to prevent damage to bark (minimum 2m). Boards are to be strapped, not screwed or nailed to the trunk.

**Ground Protection** - use device strapped over mulch or aggregate layer. Ground protection device should be of a suitable thickness to prevent soil compaction and root damage.

Steel plates (or approved equivalent) with or without mulch or aggregate layer below.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer.

Geotextile fabric underneath mulch or aggregate layer.

04 Examples of Branch, Trunk and Ground Protection

Not to Scale

Branches may require pruning to erect scaffolding. Pruning may be subject to local regulations. Flexible branches should be tied back in preference to pruning.

Minimum 1.8m high hoarding. Temporary fencing may be incorporated into scaffolding as either containment screening or as hoarding.

**Note:**
If excavation is required for installation of support post for fencing, the Project Arborist should assess any pruning of roots greater than 20mm diameter.

Scaffold planks

Boards or plywood to be installed over mulch or aggregate layer for any areas requiring access within the TPZ.

Soleplate over geotextile. No excavation for soleplate within TPZ.

Maximum 100mm and minimum 50mm depth mulch or aggregate layer within TPZ.

Geotextile fabric

05 Indicative Scaffolding within a Tree Protection Zone (TPZ) Not to Scale