



Project No: MAR/ME/12 Report No: MAR/ME/AIA/B

ARBORICULTURAL IMPACT ASSESSMENT REPORT TREE PROTECTION SPECIFICATION

Marrickville Metro – Smidmore Street Precinct

Prepared for: SITE IMAGE LANDSCAPE ARCHITECTS

17th December 2012

Rev B

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1.0 INTRODUCTION

1.1 Background

- 1.1.1 This Arboricultural Impact Assessment Report and Tree Protection Specification was prepared for Site Image Landscape Architects on behalf of AMP Capital Investors in relation to the modification of the existing Major Project Approval No. 09_0191, for the Stage 1 development of the Marrickville Metro Shopping Centre.
- 1.1.2 Previous Arboricultural Assessment Reports and Tree Protection Specifications (Rev A - dated 19th February 2010, Rev B - dated 17th May 2010, and Rev C - dated 23rd May 2010) were been prepared by IVM (TreeIQ) for this project. For consistency, tree numbering from the previous reports has been used within this report. An additional twenty (20) trees (Trees 88-108) have also been surveyed as part of this impact assessment. All of the trees have been re-assessed for this current report.
- 1.1.3 In preparing this report the author is aware of and has taken into account the objectives of the *Marrickville Council DCP (2.20 Generic Provisions Tree Management)*, *Australian Standard 4970-2009 Protection of Trees on Development Sites* and *Australian Standard 4373-2007 Pruning of Amenity Trees*.

Refer to **Appendix 1: Methodology**

- 1.1.4 The following documentation/plans were viewed in the preparation of this report:
- Cover Sheet (dated 13.12.12), prepared by Site Image Landscape Architects
 - Landscape Design Statement (dated 13.12.12), Site Image Landscape Architects
 - Landscape Character Plan (dated 13.12.12), Site Image Landscape Architects
 - Tree Removal Plan (dated 13.12.12), Site Image Landscape Architects
 - Landscape Masterplan (dated 13.12.12), Site Image Landscape Architects
 - Coloured Landscape Masterplan (dated 13.12.12), Site Image Landscape Architects
 - Landscape Plan 102 (dated 13.12.12), Site Image Landscape Architects

Refer to **Appendix 2: Supplied Plans**

1.2 Aims

- 1.2.1 The aims of this report are to:
- Review Council's policies for applicable conditions regarding the preparation of Arboricultural Reports
 - Conduct a visual assessment of the subject trees and their growing environment
 - Review the supplied plan to determine the impact on the subject trees
 - Where appropriate, recommend the use of sensitive construction methods to minimise the adverse impacts on the subject trees
 - Prepare site specific tree protection measures for the subject trees to be retained
- 1.2.2 There is no warranty or guarantee, expressed or implied that problems or deficiencies regarding the subject tree(s) or the subject site may not arise in the future. Information contained in this report covers only the subject tree(s) that was assessed and reflects the condition of the subject tree(s) at the time of inspection.

2.0 RESULTS

2.1 The Site

- 2.1.1 The subject site is a commercial allotment located to the south of the existing Marrickville Metro Shopping Centre. The subject site is bound by Smidmore Street to the north, Murray Street to the east and Edinburgh Road to the south and west.
- 2.1.2 An existing warehouse building occupies the eastern area of the subject site and a smaller single building is positioned in the centre-west.
- 2.1.3 The subject site is irregular in shape and is generally level.

2.2 The Proposal

- 2.2.1 The proposal seeks to modify the existing Major Project Approval No. 09_0191, relating to the Stage 1 development of the Marrickville Metro Shopping Centre.
- 2.2.2 Concept Plan Approval was granted on 19 March 2012 for:
- “...use of the existing building for retail premises and business premises, and expand the Marrickville Metro Shopping Centre including a first floor addition to the existing building at 34 Victoria Road, a new 2 level retail building at 13-55 Edinburgh Road and two levels of rooftop parking above each building.”*
- 2.2.3 The proposed modifications relate only to Stage 1 of the project involving the redevelopment of the existing industrial land south of Smidmore Street (13-55 Edinburgh Road) to create a two level free-standing retail addition to the shopping centre with roof top car parking.
- 2.2.4 The proposed works in the vicinity of the existing trees include the:
- Demolition of existing structures and pavements
 - Construction of a new retail building
 - Installation of landscape treatments along the Smidmore Street road reserve areas

2.3 The Trees

- 2.3.1 Thirty-one (31) trees have been surveyed as part of this assessment. With the exception of Tree 88, all of the subject trees are located within the road reserve area. Full results of the tree assessment are shown in **Appendix 3: Tree Assessment Schedule**. Tree numbers correlate with the Tree Removal Plan attached as **Appendix 2**.

3.0 ARBORICULTURAL IMPACT ASSESSMENT

3.1 Trees to be removed

- 3.1.1 The supplied plans show that twenty-three (23) trees will need to be removed to accommodate the proposed development. These include five (5) trees with a Retention Value of *Consider for Retention* and eighteen (18) trees with a Retention Value of *Consider for Removal*.

Table 1: Trees to be removed

Consider for Retention	Consider for Removal
79, 83, 88, 93 & 97.	89, 90, 91, 92, 94, 95, 96, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107 & 108.

3.1.2 No trees with a Retention Value of *Priority for Retention* are proposed for removal.

3.1.3 The trees proposed for removal with a Retention Value of *Consider for Retention* are discussed below:

3.1.4 **Trees 79 & 83** have been identified as *Eucalyptus nicholii* (Small Leaf Peppermint). These trees have a Useful Life Expectancy (ULE) range of 5-15 years and have been determined to be of moderate Landscape Significance.

3.1.5 Anecdotally, *Eucalyptus nicholii* are considered to be a relatively short lived species in the Sydney area. The assessment of Trees 79 and 83 has determined the trees' health to be fair based on the volume of deadwood contained within their crowns. Based on their fair health and performance of this species in the Sydney area, it is considered unlikely that the condition of Trees 79 and 83 will improve.

3.1.6 **Tree 88** has been identified as *Corymbia maculata/citriodora* hybrid (Spotted/Lemon Scented Gum). This tree has a ULE range of 5-15 years and has been determined to be of moderate Landscape Significance.

3.1.7 Tree 88 is an early-mature specimen growing at the junction of two existing masonry walls. As this tree has the potential to reach a greater size at maturity, its location is considered inappropriate. The tree is also partially suppressed by the larger adjacent trees.

3.1.8 **Trees 93 & 97** have been identified as *Melaleuca quinquenervia* (Broad-leafed Paperbark). The trees have a ULE range of 5-15 years and have been determined to be of moderate Landscape Significance.

3.1.9 Due to the repeated lopping for powerline clearance, the trees have developed a poor, asymmetrical crown form. High volumes of epicormic growth is also present at the lopping points. The epicormic growth that a tree produces as a result of lopping may be weakly attached and can become more prone to failure as the shoots develop into sizeable branches.

3.2 Trees to be retained

3.2.1 The supplied plans show that eight trees (8) (Trees 75-78, 80, 81, 82 and 84) are to be retained as part of the proposed works.

3.2.2 Retail Building

The supplied plans show that a new retail building is proposed within the property of 13-55 Edinburgh Road. The proposed building falls within the Tree Protection Zone (TPZ) area of Trees 77, 81, 82 and 84. For Trees 77 and 81, the extent of works represents a *Minor Encroachment* 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 incursion into the TPZ can be compensated for by extending the areas of the TPZ within the road reserve to the west/south.

3.2.3 For Trees 82 and 84, the extent of works represents a *Major Encroachment* as defined by AS-4970. Clause 3.3.4 of AS-4970 outlines that the presence of existing structures affecting root growth should be considered when determining the potential impact of an encroachment. Although the TPZ area of Trees 82 and 84 extend into the footprint of the proposed building to the south, it is likely that the radial spread of roots would have been partially restricted by the footing of the existing building and these works should have a limited impact on the trees' root systems.

3.2.4 Streetscape Works

The supplied plans show that streetscape works are proposed along the Smidmore Street frontage adjacent to the proposed retail building. Trees 75-78, 80, 81 and 84 are to be retained within soft landscape areas. Tree 82 is to be retained and incorporated into the new landscape at the entry foyer with a metal tree grate tree surround installed around its base, at the finished level of the elevated footpath.

3.2.5 The proposed streetscape works fall within the TPZ area of Trees 75-78, 80, 81, 82 and 84. The extent of works represents a *Major Encroachment* as defined by AS-4970. Clause 3.3.4 of AS-4970 outlines that tree sensitive design and construction methods should be considered when determining the potential impact of an encroachment.

3.2.6 To minimize the impact to the trees, all new pavement surfaces within TPZ areas should be installed at or above existing grade and utilise the existing sub base layer to minimize excavation and retain roots. For the pavement area directly adjacent to the proposed building, the new pavement surface should be constructed on an elevated slab supported on in-ground concrete piers to eliminate the need for the placement of fill within the TPZ areas.

3.2.7 The design of the elevated pavement should incorporate a degree of flexibility to allow for adjustments in the positioning of piers to avoid structural roots (>25mmØ). The location of piers should be determined by hand excavation and where structural roots (>25mmØ) are encountered, the position of the pier hole should be adjusted to enable the retention of these roots. The diameter of piers should be kept to a minimum as smaller diameter piers can be more easily located between tree roots with minimal root pruning. To prevent retained roots from being damaged by contact with, or encapsulation by concrete, pier holes should be sleeved with an appropriate product.

3.2.8 Elevating the pavement on piers will create a void beneath in which organic debris and rubbish falling through the tree grate may accumulate over time. To prevent this, solid wall sections (supported on a pier and above grade beam footing where required) could be installed around the perimeter of the grated tree pit. Aeration vents to allow for the circulation of air through the void beneath the elevated pavement should be provided in the pavement surface. In addition, an irrigation system with soil moisture monitors should be incorporated into the planting pits, particularly Tree 82, to ensure ongoing and adequate water supply to the trees as part of the ongoing maintenance regime for the proposed landscape treatments.

3.2.9 Trees sensitive demolition methods for the existing structures and pavement surfaces should be used. Where tree roots are in contact with, or have grown under existing kerb sections or footings within Structural Root Zone (SRZ) areas, the kerb/footing should remain in situ and be assessed by the Project Arborist to determine if they are potentially providing support to the trees' root system. Where removal of the existing pavement surfaces is required within TPZ areas, existing sub-base materials should either remain in-situ or be removed using tree sensitive demolition methods.

3.2.11 Sections 1.9-1.14 and 1.16 of the Tree Protection Specification outlines general tree sensitive methods for the demolition works, pavement installation and landscape planting works.

3.3 Pruning

3.3.1 Due to the setbacks of the new retail building, no major pruning of the Trees 75-78, 80, 81, 82 and 84 will be required. Minor Reduction Pruning of branches less than 75mm in diameter maybe required to allow for access for demolition machinery and for scaffolding during construction.

3.3.2 All pruning work should be undertaken in accordance with *Australian Standard 4373: Pruning of Amenity Trees (2007)* and the *Workcover Code of Practice for the Amenity Tree Industry (1998)*.

3.4 Replacement Planting

- 3.4.1 The landscape plan shows that replacement tree planting is proposed within the subject site. Species include *Eucalyptus paniculata* (Grey Ironbark), *Fraxinus griffithii* (Evergreen Ash) and *Olea europea* (European Olive).
- 3.4.2 The new tree plantings should be supplied in accordance with Natspec Guide- Specifying Trees.

4.0 CONCLUSION

- 4.1 The proposal seeks to modify the existing Major Project Approval No. 09_0191, relating to the Stage 1 development of the Marrickville Metro Shopping Centre. The proposed modifications relate only to Stage 1 of the project involving the redevelopment of the existing industrial land south of Smidmore Street (13-55 Edinburgh Road) to create a two level free-standing retail addition to the shopping centre with roof top car parking.
- 4.2 Thirty-one (31) trees have been surveyed as part of this assessment. With the exception of Tree 88, all of the subject trees are located within the road reserve area.
- 4.3 The supplied plans show that twenty-three (23) trees will need to be removed to accommodate the proposed works. These are Trees 79, 83, 88-108.
- 4.4 Of the trees proposed for removal, Trees 89-92, 94-96, 98, and 99 108 have been allocated a Retention Value of *Consider for Removal*. Despite fulfilling the criteria to be allocated a Retention Value of *Consider for Retention*, Trees 79, 83, 88, 93 and 97 have a relatively short (5-15 years) estimated Useful Life Expectancy and their removal and replacement as part of the proposed works is considered the most appropriate option.
- 4.5 The supplied plans show that eight trees (8) (Trees 75-78, 80, 81, 82 and 84) are to be retained as part of the proposed works. As works are to be undertaken within TPZ areas, tree sensitive demolition and construction methods will be required to minimise the impact of the works on the trees to be retained.
- 4.6 Due to the setbacks of the new retail building, no major pruning of the will be required. Minor Reduction Pruning of Trees 75-78, 80, 81, 82 and 84 of branches less than 75mm in diameter maybe required to allow for access for demolition machinery and for scaffolding during construction.
- 4.7 Sections 1.9-1.14 and 1.16 of the Tree Protection Specification (**Appendix 5**) outlines general tree sensitive methods for the demolition works, pavement installation and landscape planting works. Prior to the commencement of the works, a site specific Tree Protection Plan should be prepared providing details for the establishment of tree protection zones, arboricultural supervision of works (as required) and tree sensitive design, demolition and construction works relating to each tree to be retained.
- 4.8 The landscape plan shows that replacement tree planting is proposed within the subject site. Species include *Eucalyptus paniculata* (Grey Ironbark), *Fraxinus griffithii* (Evergreen Ash) and *Olea europea* (European Olive).

NOTE 1: Reference should be made to any relevant legislation including Tree Preservation Orders. All recommendations contained within this report are subject to approval from the relevant Consent Authority.

NOTE 2: This report provides recommendations relating to tree management only. Advice should be sought from appropriately qualified consultants regarding design/construction issues.

NOTE 3: It should be acknowledged that a comprehensive hazard assessment and management plan for the trees is beyond the scope of this report.

AS 4970, 2009: *Tree iQ- amended and reproduced under copyright Licence1110-c049*

AS 4373, 2007: *Tree iQ- amended and reproduced under copyright Licence1110-c049*

5.0 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.

Harris, Clark & Matheny (1999), *Arboriculture: Integrated Management of Landscape Trees, Shrubs And Vines*, Prentice Hall, New Jersey.

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Simon, Dormer & Hartshorne (1973), *Lowson's Botany*, Bell & Hyman, London.

Standards Australia (2003), *Composts, Soil Conditioners and Mulches AS-4454*.

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

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

Appendix 1: Methodology

- 1.1 **Site Inspection:** This report was determined as a result of a comprehensive site inspection during December 2012. The comments and recommendations in this report are based on findings from this site inspection.
- 1.2 **Visual Tree Assessment (VTA):** The subject tree(s) was visually assessed from the ground using the industry standard, VTA criteria and notes. The inspection was limited to a visual examination of the subject tree(s) from ground level only. No internal diagnostic 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 plan attached as Appendix 2. 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 the Standard 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 the Standard 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 standard. 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 determined by assessing:
- 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 assessed by:
- I. Visible evidence of structural defects or instability
 - II. Evidence of previous pruning or physical damage

Where the tree's base could not be accessed, no structural rating has been allocated.

- 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

- 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 <i>Local Environmental Plan</i> with a local or state level of significance.
	The subject tree is listed on Council's Significance Tree Register.
	The subject tree is a remnant tree.
High	The subject tree creates a 'sense of place' or is considered 'landmark' tree.
	The subject tree is of local, cultural or historical importance or is widely known.
	The subject tree is scheduled as a Threatened or Vulnerable Species or forms part of an Endangered Ecological Community under the provisions of the <i>Threatened Species Conservation Act 1995 (NSW)</i> or the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> .
	The subject tree is known to provide habitat to a threatened species.
	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.
	The subject tree forms part of the curtilage of a heritage item with a known or documented association with that item.
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 has a known habitat value.
	The subject tree is a good representative of the species in terms of aesthetic value.
Low	The subject tree is an environmental pest species or is exempt under the provisions of the local Council's Tree Preservation Order.
	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.
Insignificant	The subject tree is declared a Noxious Weed under the Noxious Weeds Act

The above table has been modified from the EarthscapeCriteria for Assessment of Landscape Significance

- 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

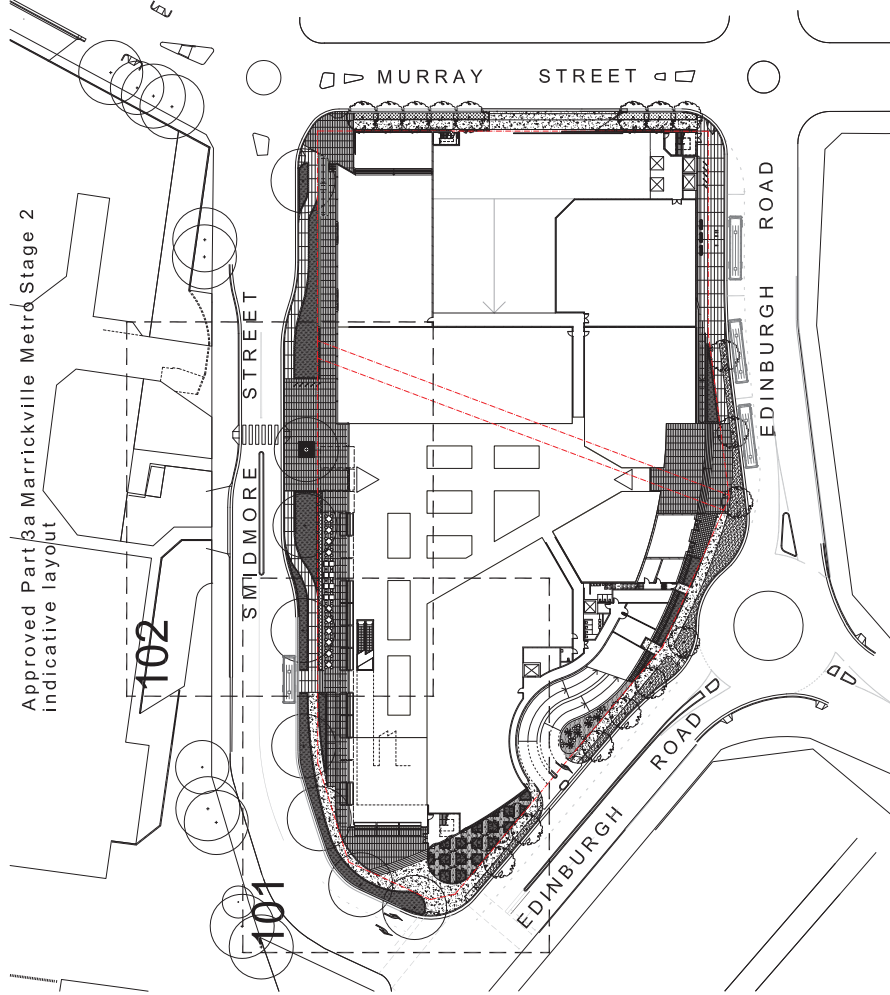
ULE		Landscape Significance			
	Very High	High	Moderate	Low	Insignificant
40 years +	Priority for Retention	Priority for Retention		Consider for Removal	Priority for Removal
15-40 years		Priority for Retention	Consider for Retention		
5-15 years		Consider for Retention			
Less than 5 years	Consider for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

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

Marrickville Metro Expansion

AMP Capital Investments

- | | |
|------|-----------------------------|
| 000 | Coversheet |
| 001 | Landscape Design Statement |
| 002 | Landscape Character Plan |
| 010 | Tree Removal Plan |
| 100 | Landscape Masterplan |
| C100 | Colour Landscape Masterplan |
| C101 | Landscape Plan |
| 102 | Landscape Plan |



NOT FOR CONSTRUCTION

A1

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The contractor shall check and verify all work on the (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred the Landscape Architect for confirmation.

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LEGEND

Section 75W Notes

This Section 75W Landscape Design package has been prepared on behalf of AMP Capital Investors to accompany an application to modify the existing Concept Plan Approval under Section 75W of the *Environmental Planning & Assessment Act 1979*. This application seeks to modify the existing Major Project Approval No. 09_0191, relating to the Stage 1 development of the Murrumbidgee Metro Shooting Centre.

Indicative Plant Schedule

Botanical Name	Common Name	Mature Height (m.)	Mature Spread (m.)	Plant Origin	Water Rating
Trees					
<i>Eucalyptus paniculata</i>	Grey Ironbark	15-30	10	Indigenous	Low
<i>Fraxinus griffithii</i>	Evergreen Ash	8	4	Medium	Low
<i>Olea europaea</i>	Olive Tree	6	4	Non indigenous	Low
Herbs					
<i>Acnema smithii var minor</i>	Dwarf Lilybilly	3	2	Indigenous	Medium
<i>Acnema smithii var minor</i> 'Allyn Magic'	Allyn Magic Lily Pilly	0.8	0.8	Indigenous	Medium
<i>Wyniaea Wyniaea</i>	Wyniaea	1.5	1.5	Non indigenous	Medium
<i>Wyniaea Wyniaea</i> 'Gent'	Wyniaea Rosemary	1.5	1.5	Indigenous	Low
Groundcovers					
<i>Cycad acuta</i>	Cycad	3	2	Non indigenous	Medium
<i>Doryanthes excelsa</i>	Gymea Lily	2	2	Indigenous	Low
Groundcovers & Grasses					
<i>Liriodie muscari</i> 'Evergreen Giant'	Giant Linopie	0.6	0.5	Non indigenous	Medium
<i>Lomandra longifolia</i> 'Tankie'	Tankie Mat Rush	0.7	0.6	Indigenous	Low
<i>Trachelospermum aspidioides</i>	Star Jasmine	0.3	1	Indigenous	Low
<i>Themeda australis</i>	Kangaroo Grass	0.8	0.3	Indigenous	Low
<i>Pholidotum Ximidi</i>	Xenadi	0.8	0.8	Non indigenous	High
<i>Carex appressa</i>	Grass Flag	0.6	0.6	Indigenous	Medium
<i>Stylidium</i>	Stylidium	0.7	0.7	Indigenous	Medium
<i>Knoby Club Grass</i>	Knoby Club Grass	0.7	0.7	Indigenous	Low
<i>Knoby Club Rush</i>	Knoby Club Rush	0.7	0.6	Indigenous	Low
<i>Isopogon toposifolia</i> 'Tankie'	Tankie	0.7	0.7	Indigenous	Low

Client:



Project: **Marrickville Metro Expansion**

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SECTION 75W

Drawing Name:

Cover Sheet

Scale: 1:500 @ A1

Job Number:

SS12-2547

Sheet 1 of 1

Drawing Number: 25m

Section 75W Submsslon based on modification of the
existing Concept Plan

- Concept Plan Approval was granted on 19 March 2012 for:
 ...use of the existing building for retail premises and business premises, and expand the Martineville Metro Shopping Centre including a first floor addition to the existing building at 34 Victoria Road, a new 2 level retail building at 13-55 Edinburgh Road and two levels of rooftop parking above each building.”
- The proposed modifications relate only to Stage 1 of the project involving the redevelopment of the existing industrial land south of Smidmore Street (13-55 Edinburgh Road) to create a two level free-standing retail addition to the shopping centre with roof top car parking.
- The proposed modifications seek to refine the approved design, enhancing its design quality both internally, and externally, and its relationship with the public domain.

1.0 Smidmore Street (Refer Concept Plan: Zone1)

- A central road crossing is proposed to link the Snidmore Street precinct development with that of Marickville and Midway Stage 2.
- Once this crossing point reaches the edge of the footpath it is proposed to treat the paving as an address to the Building and pedestrian access is to be by way of a slight incline to the building entry.
- There are a number of large, good specimen Lemon scented Gum trees (*Corymbia citratorunda*) on the southside of Snidmore Street which are proposed to be retained. Two smaller specimen Eucalypt trees are proposed for removal, based on their visually poor specimen status.
- These large impressive existing trees to be retained compliment the scale of the building & the large scale architectural treatment of the footpath. The new building proposal is also set back at a greater distance from the street, to ensure that the tree canopies are not compromised.
- In order to retain one of the Lemon Scented Gum trees at the Building entry it is proposed to suspend the paving over the existing tree level using a tree grille.
- The remaining Lemon Scented Gums will be accommodated in a above-retention area at the lower street tree level and surrounded by a planting area of native grasses.
- There is a distinctive two level treatment to Snidmore street. The lower area is proposed as a functional footpath link, incorporating a setback area.
- The upper level is proposed to be separated from the lower using a combination of a high level sealing wall and a low level planter wall.
- The upper level is proposed as a combination of circulation space and activity area, with potentially outdoor dining or temporary market stalls. The low sealing wall is proposed to add to the recreational amenity of the area, when these functions do not exist.

4.0 Level 2A: Roof Garden

- Provision has been made within the architectural design to accommodate a Roof Garden area which could potentially be a 'Community Garden'. Raised planters made of timber or metal are proposed.

**Landscape Design Statement Notes for Section 75W Submission for
Smldmore Street Precinct**

- These notes are to outline the modifications that are proposed for the Section 75W submission with reference to the original Landscape Design Statement for the Part 3A submission.
- The notes seek to address the 3 street frontages with respect to the status of existing trees and the design concepts of these areas, with regard to the function of the area, design of the building frontage and any attention to changes in level.
- An associated Arborist Report will be submitted in conjunction with this application which will include an assessment of the existing trees affected by the new development to the Smlindroe Street Precinct.

2.0 Edinburgh Road (Refer Concept Plan: Zone 2)

- There are a number of existing trees on Edinburgh Road (not previously assessed), however all are either immature, of poor specimen or inconsistent with the proposed treatment of the street.
- 9 no. new trees are proposed to be planted to the Edinburgh Road verge, using a type of Eucalyptus tree species to continue the planting theme of the previous Part 3A submission area. In addition a significant grove of trees is also proposed.
- The landscape design of Edinburgh Road is influenced to some extent by the differing functional aspects of the building & street.
 - The western end is proposed as a feature grove of trees (with a minimum of 9 trees) in a low level bio-retention area, that combines a formal layout of trees & either native grasses or low shrub planting amongst an inert ground surface treatment, such as gravel.
 - The next area continues the treatment of an inert ground surface, punctuated by feature plants, such as cycads.
 - As the building sweeps around Edinburgh Road with a translucent curved facade, the landscape treatment is a two layer concept of shrub planting and drizzling plants that set off a proposed feature of smaller trees that are designed to follow this building facade using a series of horizontal wires. At the street verge this curve is complimented by a sweep of maintained grass verge.
 - The eastern end of Edinburgh Road is mainly a function of the bus interchange area, with the landscape treatment largely limited to functional landscape elements.

General Landscape Concept / Materials

- The overall concept is based on simple, large scale design features, but with an attention to detail that will compliment the scale of the building and its associated attention to detail.
- Low level planted bio-retention areas are proposed on both Smlidmore Street and Edinburgh Road.

Existing Trees & New Tree Planting

- There are a total of 10 existing trees on Snidmore Street, of which 8 are proposed for retention. The 2 trees proposed for removal are poor specimens which detract from the impressive 8 existing trees proposed for retention.
- There are also existing trees on Edinburgh Road which are proposed for removal but they have no visual significance either being immature in status; of poor specimen quality (including severely topped); or of an inappropriate species.
- These 21 trees are proposed to be replaced by 3 large Eucalypt trees and a significant grove of trees (min 9 m), together with a further 8 large ornamental trees on Murray Street, making a total of at least 26 new trees.

3.0 Murray Street (Refer Concept Plan: Zone 3)

- There are no existing trees on Murray Street and the existing buildings provide no existing Industrial feel. 8 no. new trees are proposed to be planted on this verge.
- The landscape design for Murray Street is proposed to punctuate the street with a delicate but large feature tree to provide Visual Interest throughout the year such as an Evergreen Ash (*Fraxinus griffithii*). The scale of the tree to match the scale of the building.
- To continue the industrial feeling of the street it is function **primarily** as a loading dock access is proposed to introduce a green **element** to the facade using a slender following vertical wires or chains, accommodated in recesses that are incorporated into the building design.
- This climber / ground cover plant is also proposed for use in the verge of Murray Street, to break up the industrial nature of the street using a robust, but visually attractive ground covering plant.

The contractor shall check and verify all work on site (including work by others) before commencing the Landscape Installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

[illegible]

LEGEND



client



Projet

Marrickville Metro Expansion

SITE IMAGE



Landscape Architects

SECTION 75W

Drawing Name:

Landscape Design Statement

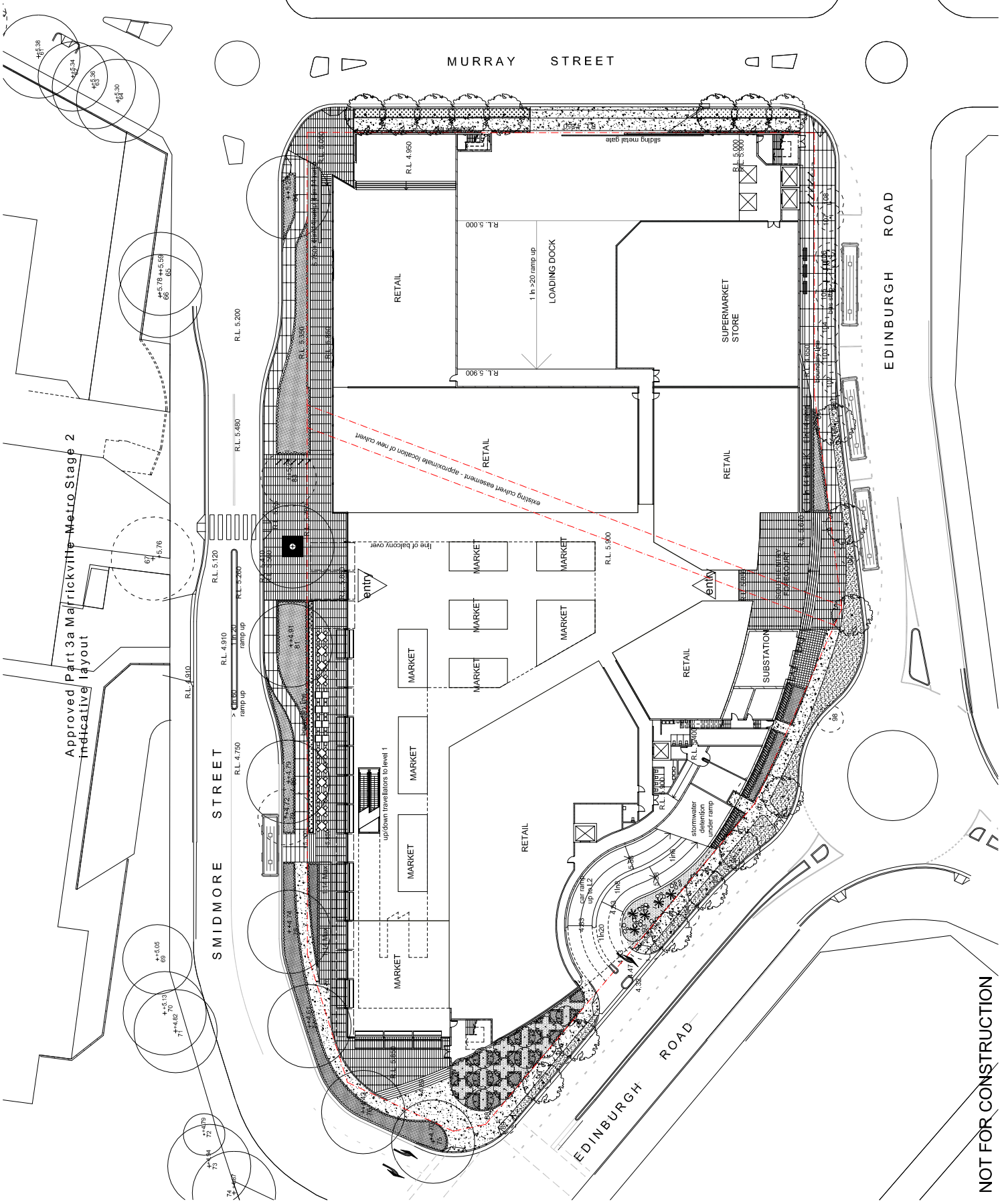
Sheet 1 of 1

Scale:

Division Member*

SS12-2547

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LEGEND

Existing Trees to be Retained

Existing Trees to be Removed

Proposed Street Trees

Proposed Feature Trees - Olive Trees

Paving

h-cul concrete paving

Large scale pebbles & gravel

Planting

Turf

AMP capital INVESTORS

Project: Marickville Metro Expansion

SITE IMAGE

Scale: 1:250 @ A1

Job Number: SS12-2547

SECTION 75W

Landscape Masterplan

Drawn: [Name]

Checked: [Name]

Reviewed: [Name]

Approved: [Name]

Date: [Date]

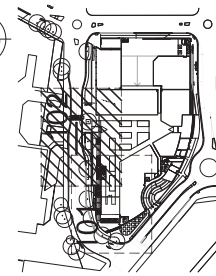
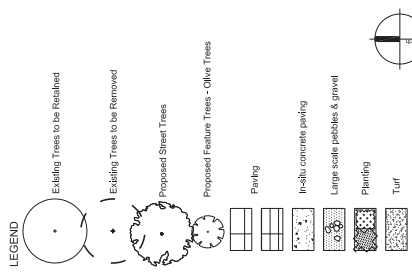
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The contractor shall check and verify all work on site including work by others. The contractor shall ensure that all work is carried out in accordance with the instructions of the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required alterations not shown on this drawing are the responsibility of the contractor.

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The contractor shall check and verify all work on site (including work by others) before commencing the landscape installation. Any discrepancies are to be reported to the Project Manager or Landscape Architect prior to commencing work. Do not scale this drawing. Any required dimensions not shown shall be referred to the Landscape Architect for confirmation.

[illegible]

Only: **AMP capital INVESTORS**

Project: **Marrickville Metro Expansion**

S I T E I M A G E

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Sydney Hills NSW 2070
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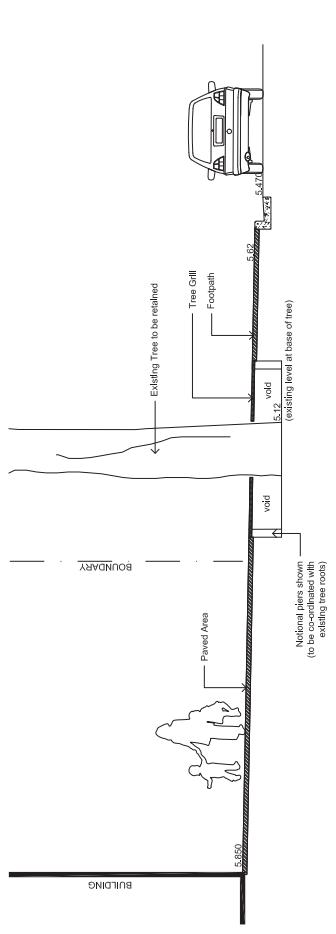
Level 1, 3-5 Bopitt Street
Sydney Hills NSW 2070
Australia

SECTION 75W
Drawing Name:
Landscape Plan

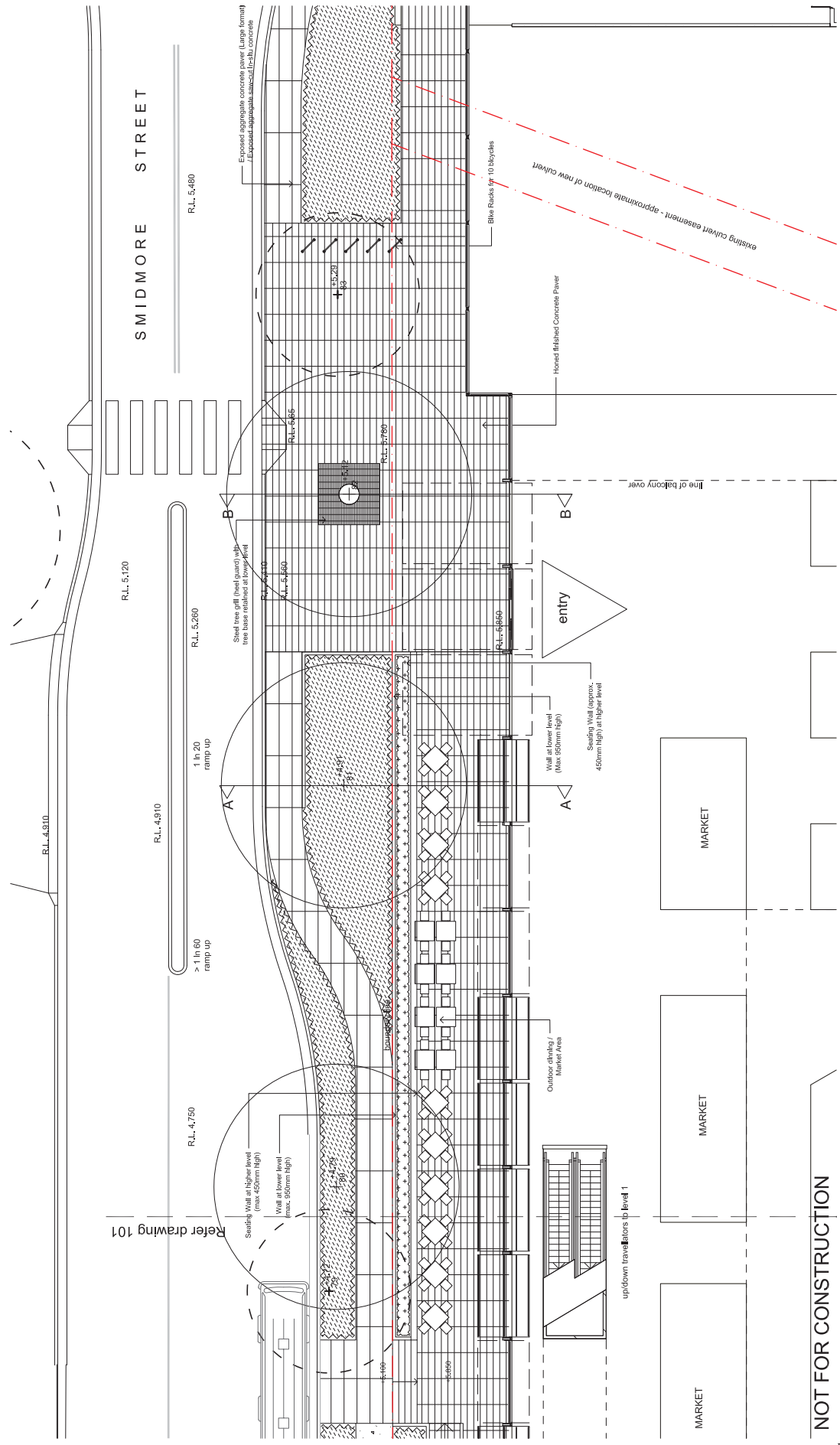
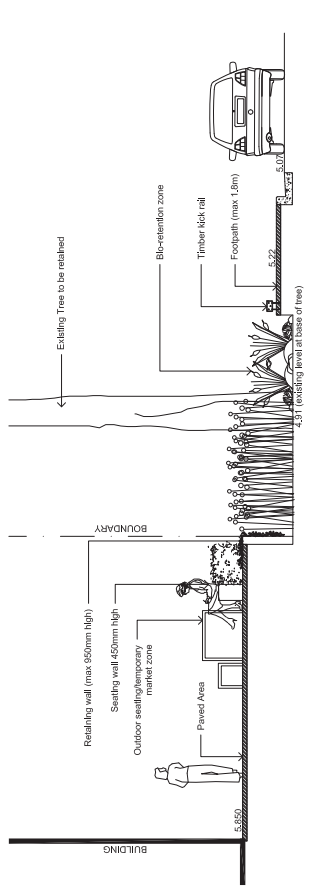
Sheet 2 of 2

Scale:	Drawing Number:	Issue:
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SS12-2547	102	B

BB Typical Section
SCALE: 1:50

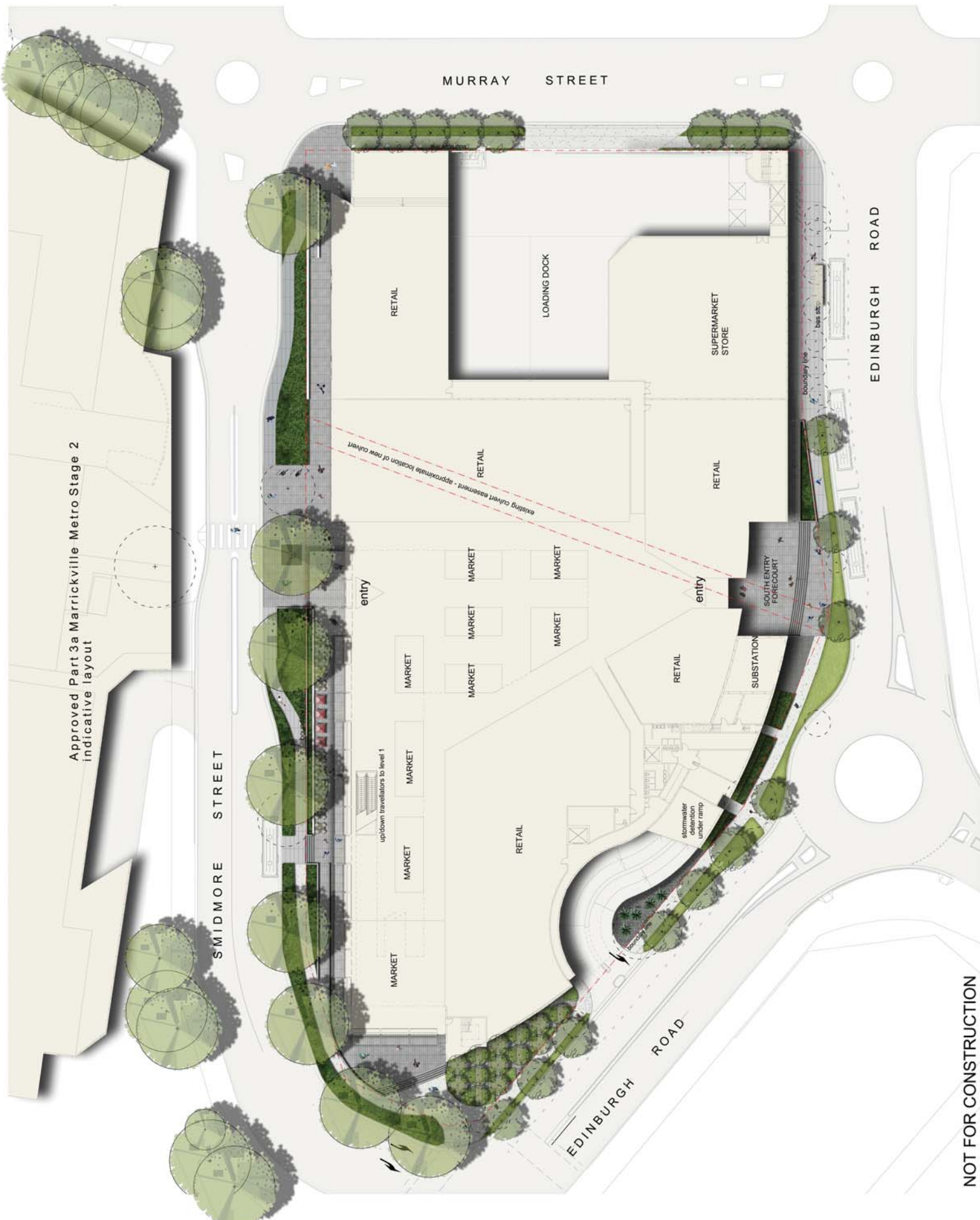


AA Typical Section
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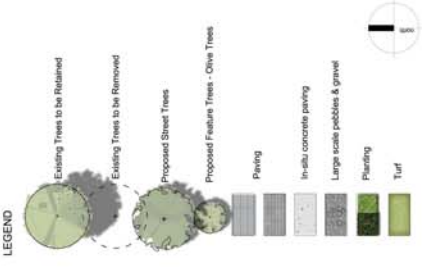
NOT FOR CONSTRUCTION

Approved Part 3a Marrickville Metro Stage 2
indicative layout



NOT FOR CONSTRUCTION

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Client: **AMP capital INVESTORS**

Project:
Marrickville Metro Expansion

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**Land 1, 3-5 Reginald Street
Surry Hills NSW 2010
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Landscape Architects

SECTION 75W

Colour Landscape Masterplan

Sheet 1 of 1

Scale: 1:250 @ A1

Job Number:

Drawing Number:

10m

North

SS12-2547

C100 B

Appendix 3: Tree Assessment Schedule

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
75	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	700	15	7	Good	Good	Low volumes of medium (25-75mm) diameter deadwood. Girdled roots. Existing structures within SRZ.	15-40	High	Priority for Retention	8.4	2.9	Retain. Major encroachment, landscape treatment.
76	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	700	15	7	Fair	Good	Crown density 50-75%. Existing structures within SRZ.	5-15	High	Consider for Retention	8.4	2.9	Retain. Major encroachment, landscape treatment.
77	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	700	15	6	Fair	Good	Low volumes of large (75mm+) diameter deadwood. Existing structures within SRZ.	15-40	High	Priority for Retention	8.4	2.9	Retain. Minor encroachment, building. Major encroachment, landscape treatment.
78	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	700	15	7	Fair	Good	Crown density 50-75%. Existing structures within SRZ.	5-15	High	Consider for Retention	8.4	2.9	Retain. Major encroachment, landscape treatment.
79	<i>Eucalyptus nicholii</i> (Small Leaf Peppermint)	400, 400	9	5	Fair	Fair	Phototropic lean. Moderate volumes of medium diameter (25-75mm) deadwood. Wound with early stages of decay. Existing structures within SRZ.	5-15	Moderate	Consider for Retention	6.6	2.6	Remove. Landscape treatment.
80	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	700	15	7	Fair	Good	Low volumes of medium (25-75mm) diameter deadwood. Crown density 50-75%. Girdled roots. Existing structures within SRZ.	5-15	High	Consider for Retention	8.4	2.9	Retain. Major encroachment, landscape treatment.
81	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	700	15	8	Good	Good	Low volumes of medium (25-75mm) diameter deadwood. Existing structures within SRZ.	15-40	High	Priority for Retention	8.4	2.8	Retain. Minor encroachment, building. Major encroachment, landscape treatment.
82	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	1000	18	8	Good	Good	Structures within SRZ.	15-40	High	Priority for Retention	12	3.4	Retain. Major encroachment, building and landscape treatment.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
83	<i>Eucalyptus nicholii</i> (Small Leaf Peppermint)	300, 450	9	8	Fair	Good	Moderate volumes of small diameter (<25mm) deadwood. Low volumes of small diameter (<25mm) epicormic growth. Partially suppressed. Existing structures within SRZ.	5-15	Moderate	Consider for Retention	6.6	2.6	Remove. Landscape treatment.
84	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	850	18	10	Good	Good	Low volumes of medium diameter (25-50mm) deadwood. Crown density 75-95%. Structures within SRZ.	15-40	High	Priority for Retention	10.2	3.1	Retain. Major encroachment, building and landscape treatment.
88	<i>Corymbia maculata/citriodora</i> hybrid (Spotted/Lemon Scented Gum)	300	6	6	Good	Good	Retaining wall within SRZ. Partially suppressed.	5-15	Moderate	Consider for Retention	3.6	2	Remove. Landscape treatment.
89	<i>Acmena smithii</i> 'Minor' (Lillypilly)	< 50	1	2	Fair	Fair	Under powerlines. Whipper snipper damage. Scale and sooty mould.	5-15	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
90	<i>Acmena smithii</i> 'Minor' (Lillypilly)	< 50	1	2	Fair	Good	Under powerlines. Crown density 25-50%.	5-15	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
91	<i>Leptospermum petersonii</i> (Lemon-scented Tea Tree)	100	2	3	Fair	Good	Under powerlines. Crown density 50-75%.	5-15	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
92	<i>Syzygium australe</i> (Brush Cherry Lillypilly)	100	2	3	Good	Fair	Under powerlines. Mechanical damage to base with resultant suckering.	5-15	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
93	<i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark)	600	8	7	Good	Poor	Lopped for powerline clearance. High volumes of small diameter (<25mm) epicormic growth. Wound/s, no visible signs of decay. Poor form.	5-15	Moderate	Consider for Retention	7.2	2.7	Remove. Landscape treatment.
94	<i>Elaeocarpus reticulatus</i> (Blueberry Ash)	100	5	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
95	<i>Leptospermum petersonii</i> (Lemon-scented Tea Tree)	200	3	2	Good	Fair	Co-dominant inclusion.	5-15	Low	Consider for Removal	2.4	1.7	Remove. Landscape treatment.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
96	<i>Elaeocarpus reticulatus</i> (Blueberry Ash)	100	4	1	Good	Fair	Mechanical damage to base.	15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
97	<i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark)	1000	12	7	Good	Poor	Lopped for line clearance. High volumes of small diameter (<25mm) epicormic growth. Included branch junction/s. Poor form.	5-15	Moderate	Consider for Retention	12	3.4	Remove. Landscape treatment.
98	<i>Acmena smithii</i> 'Minor' (Lillypilly)	150	2	2	Good	Poor	Wound with early stages of decay. Co-dominant inclusion. Previous branch failure.	5-15	Low	Consider for Removal	2.2	1.5	Remove. Landscape treatment.
99	<i>Eucalyptus scoparia</i> (Willow Gum)	<50	2	1	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
100	<i>Pistacia chinensis</i> (Pistacia)	<50	2	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
101	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	100	4	2	Good	Good	Mechanical damage to roots.	15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
102	<i>Acmena smithii</i> 'Minor' (Lillypilly)	100	3	2	Good	Good		15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
103	<i>Callistemon viminalis</i> (Weeping Bottlebrush)	100	4	2	Good	Fair	No access to base. Mechanical damage to base.	15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
104	<i>Acmena smithii</i> 'Minor' (Lillypilly)	100	2	2	Good	N/A	No access to base.	15-40	Low	Consider for Removal	2	1.5	Remove. Landscape treatment.
105	<i>Livistona australis</i> (Cabbage Tree Palm)	300	5	2	Good	N/A	No access to base.	15-40	Low	Consider for Removal	3.6	2	Remove. Landscape treatment.
106	<i>Livistona australis</i> (Cabbage Tree Palm)	300	3	2	Good	N/A	No access to base.	15-40	Low	Consider for Removal	3.6	2	Remove. Landscape treatment.
107	<i>Livistona australis</i> (Cabbage Tree Palm)	300	4	2	Good	Good		15-40	Low	Consider for Removal	3.6	2	Remove. Landscape treatment.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	TPZ (m)	SRZ (m)	Implication
108	<i>Livistona australis</i> (Cabbage Tree Palm)	350	5	2	Good	Good		15-40	Low	Consider for Removal	4.2	2.2	Remove. Landscape treatment.

Appendix 4: Plates



Plates (left to right)

Plate 1: Trees 78-80

Plate 2: Tree 81

Plate 3: Tree 84

Plate 4: Trees 88

Plate 5: Tree 91

Plate 6: Tree 97

Plate 7: Tree 103

Plate 8: Tree 105

Appendix 5: General 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 trees 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
- Cultivation of the soil
- Mechanical removal of vegetation
- Soil disturbance
- Movement of natural rock
- Storage of materials, plant or equipment
- Erection of site sheds
- Affixing of signage or hoarding to the trees
- Preparation of building materials
- Disposal of waste materials and chemicals
- Lighting fires
- Refuelling
- 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 Site Arborist.

1.3 Tree Protection Fencing

Tree Protection Fencing shall be installed at the perimeter of the TPZ or as deemed necessary by the Project Arborist. The Tree Protection Fence shall consist of temporary mesh panel fencing (minimum height 1.8m) supported by concrete feet. Fencing panels shall be fastened together and supported to prevent sideways movement. The fence must have a lockable opening for access. The tree shall not be damaged during the installation of the Tree Protection Fencing. Refer to **Appendix 6: Typical Tree Protection Details (3)**.

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 Trunk & Branch Protection

Where deemed necessary by the Project Arborist, trunk protection shall be installed by wrapping padding around the trunk to a minimum height of 2m or as the lower branches permit. 2m lengths of timber battons (75 x 50 x 200mm) spaced at 100mm centres shall be strapped together and placed over the padding. Branch protection shall be installed to those branches 1m or closer to scaffolding. Branch protection shall be installed by wrapping padding around the branch. Refer to **Appendix 6: Typical Tree Protection Details (4)**.

1.6 Site Management

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

1.7 Ground Protection & Temporary Access

Where required, Ground Protection & Temporary Access within the TPZ shall be confirmed through consultation between the Head Contractor/Project Manager and the Project Arborist.

Where light traffic access <3.5 tons is required the ground surface shall be protected by a 100mm deep mulch cover overlaid with rumble boards/road plates. The mulch shall be Horticultural Grade Pine Bark as certified to *AS4454: Composts, Soil Conditioners and Mulches* (1997). The mulch shall be spread by hand to avoid soil disturbance and compaction.

Where heavy traffic access >3.5 tons is required the ground surface shall be protected by a layer of geo-textile fabric over a 100mm layer of lightly compacted road base. The geo-textile shall extend a minimum of 300mm beyond the edge of the mulch and road base. When removing temporary access road the material shall be removed with care to prevent disturbance of natural ground levels below. Refer to **Appendix 6: Typical Tree Protection Details (4)**.

1.8 Scaffolding

Where possible, scaffolding shall not be located within the TPZ. Scaffolding shall not be in contact with the tree. As necessary, this shall be achieved by erecting scaffolding around branches. Branches shall be tied back and protected as deemed necessary by the Project Arborist. Refer to **Appendix 6: Typical Tree Protection Details (5)**

1.9 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 structural roots (>25mm ϕ) 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 structural roots (>25mm ϕ) where deemed necessary by the Project Arborist.

1.10 Structure Demolition

Demolition of existing structures 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 should not contact the tree's roots, trunk, branches and crown.

When removing slab sections within TPZ, machinery shall work backwards out of the TPZ to ensure machinery remains on undemolished sections of slab at all times. Wherever possible, footings or elements below grade shall be retained to minimise disturbance to the tree's roots.

Where deemed necessary by the Project Arborist, the structures shall be shattered prior to removal with a hand-operated pneumatic/electric breaker.

If structural roots (>25mm ϕ) 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 mat. The mat shall be kept in a damp condition at all times. Where the Project Arborist determines that the subject tree is using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

1.11 Kerb Demolition

Demolition of the existing kerb 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 should not contact the tree's roots, trunk, branches and crown.

For the demolition of the kerb within the TPZ, the sections to be demolished shall be cut (in small increments) using a hand-operated motorised concrete saw with an appropriate diamond blade. The depth of the saw cut shall be a minimum of 20mm less than the thickness of the surface. Over-cutting into the sub-base has the potential to damage roots which may be present below.

The kerb to be demolished shall be carefully fractured in small sections. Hand tools or a hand-operated pneumatic/electric breaker shall be used only. Once the existing kerb has been fractured, the broken-up surface material shall be removed by hand.

If structural roots (>25mm ϕ) 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 mat. The mat shall be kept in a damp condition at all times. Where the Project Arborist determines that the subject trees are using underground elements (i.e footings, pipes, rocks etc.) for support, these elements shall be left in-situ.

Where tree roots are in contact with, or have grown under existing kerb sections within Structural Root Zone areas, the kerb shall remain in situ and be assessed by the Project Arborist.

1.12 Pavement Demolition

Demolition of the existing pavements within the TPZ shall be supervised by the Project Arborist. The existing pavement shall be carefully lifted by hand to minimise damage to the existing sub-base and to prevent damage to tree roots. Wherever possible, the existing sub-base material shall remain in-situ.

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 should not contact the tree's roots, trunk, branches and crown.

The exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat shall be kept in a damp condition at all times.

If structural roots (>25mm ϕ) are encountered during the lifting of the existing pavement surfaces, these roots must be retained in an undamaged condition and advice sought from the Project Arborist.

1.13 Pavement Installation

Installation of the new sub-base and pavement within the TPZ shall be supervised by the Project Arborist. The pavement shall be placed above grade to minimise excavations and retain roots (unless prior root mapping results show above sensitive construction to be unnecessary).

If structural roots (>25mm ϕ) are encountered during the installation of the new sub-base pavement, 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 structural roots (>25mm ϕ) where deemed necessary by the Project Arborist.

If required, the new sub-base material shall be a 20mm no-fines road base (Benedict Sand & Gravel - Product Code 20NF/RB or similar approved material). The sub-base shall only be imported and spread when the underlying soil conditions are dry to avoid compaction. The depth of the new sub-base shall be no lower than the existing ground level to protect roots.

The bedding sand shall be a washed river sand (recycled crushed paving blends shall not be used). The bedding sand shall be consolidated with a non-vibrating roller to minimise soil compaction within the TPZ. If possible, the pavement material shall be permeable to allow for water infiltration and gaseous exchange into the underlying soil.

Root pruning and excavations shall be undertaken as outlined within Section 1.17.

1.14 Footings

Installation of the footings within the TPZ shall be supervised by the Project Arborist. Footings within the TPZ shall be constructed using a pier and beam footing system to minimise excavation and to retain roots (unless prior root mapping results show above sensitive construction to be unnecessary). All parts of the foundation structure shall be installed above grade other than supportive piers.

The beam section of any pier and beam footing shall be placed above existing ground level. Foundations for piers shall be initially hand dug to a depth of 700mm or to rock. If structural roots (>25mmØ) greater than 25mmØ are found, the pier position shall be relocated. Root pruning and excavations shall be undertaken as outlined within Section 1.17. The pier footings shall be sleeved.

1.15 Underground Services

Installation of underground services within the TPZ shall be supervised by the Project Arborist. Wherever possible, underground services shall not be located within the TPZ.

Where underground services run through the TPZ of trees to be retained, hand trenching/hydro vacuum excavation methods shall be used to minimise damage to tree roots. When undertaking hydro-vacuum excavation, the tip of the high pressure lance is not to be pointed directly at roots at close range to avoid the removal or damage to bark. It is essential that the bark of roots remain intact.

If structural roots (>25mmØ) are encountered during the excavation works, these roots should be retained in an undamaged condition and advice sought from the Project Arborist. In section of trench where structural roots (>25mmØ) are present and are to be retained, the services shall be either be re-routed or where falls permit, feed below these roots.

If there is any delay between excavation works and backfilling, exposed roots shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat shall be kept in a damp condition at all times.

Root pruning and excavations shall be undertaken as outlined within Section 1.17.

1.16 Shrub and Groundcover Planting

The planting locations with the TPZ shall remain flexible to avoid damage to roots. In some cases, small stock may be the only suitable size for planting within the TPZ. Planting shall be carefully undertaken by hand using a small garden trowel to prevent damage to tree roots.

1.17 Excavations & Root Pruning

Excavations and root pruning within the TPZ shall be supervised by the Project Arborist. Excavations within the TPZ shall be avoided wherever possible.

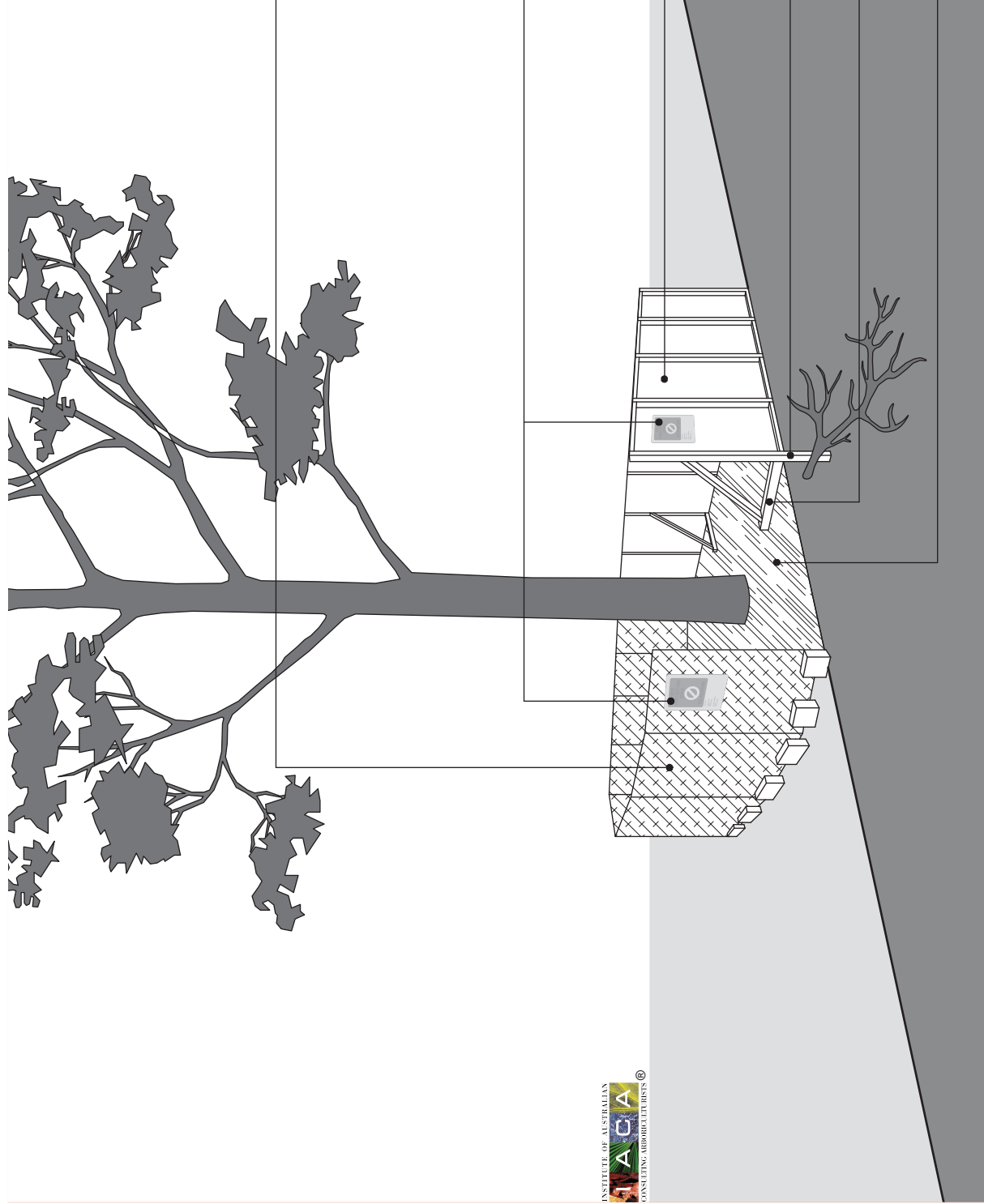
Excavations within the TPZ shall be undertaken by hand or using hydro vacuum excavation methods (or similar approved device) to protect tree roots.

Pruned roots shall be cleanly severed with sharp pruning implements to ensure a smooth wound face, free from tears. Severance of structural roots (>25mmØ) within the Structural Root Zone is not recommended as it may lead to tree destabilisation. **All root pruning requires approval from the Project Arborist.**

Pruned roots shall be immediately treated with a suitable trichoderma-based seedling inoculant product such as Tri-D25 (or similar approved product) mixed with a root growth hormone product containing the active constituents Indol-3-yl-Butric Acid (IBA) and 1-Naphthylacetic Acid (NAA). The exposed roots and excavation face shall be protected from direct sunlight, drying out and extremes of temperature by covering with a 10mm thick jute mat. The mat shall be kept in a damp condition at all times.

Appendix 6: Typical Tree Protection Details

Adapted from *AS 4970-2009 Protection of Trees on Development Sites*
(Source: Institute of Australian Consulting Arboriculturists)



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.

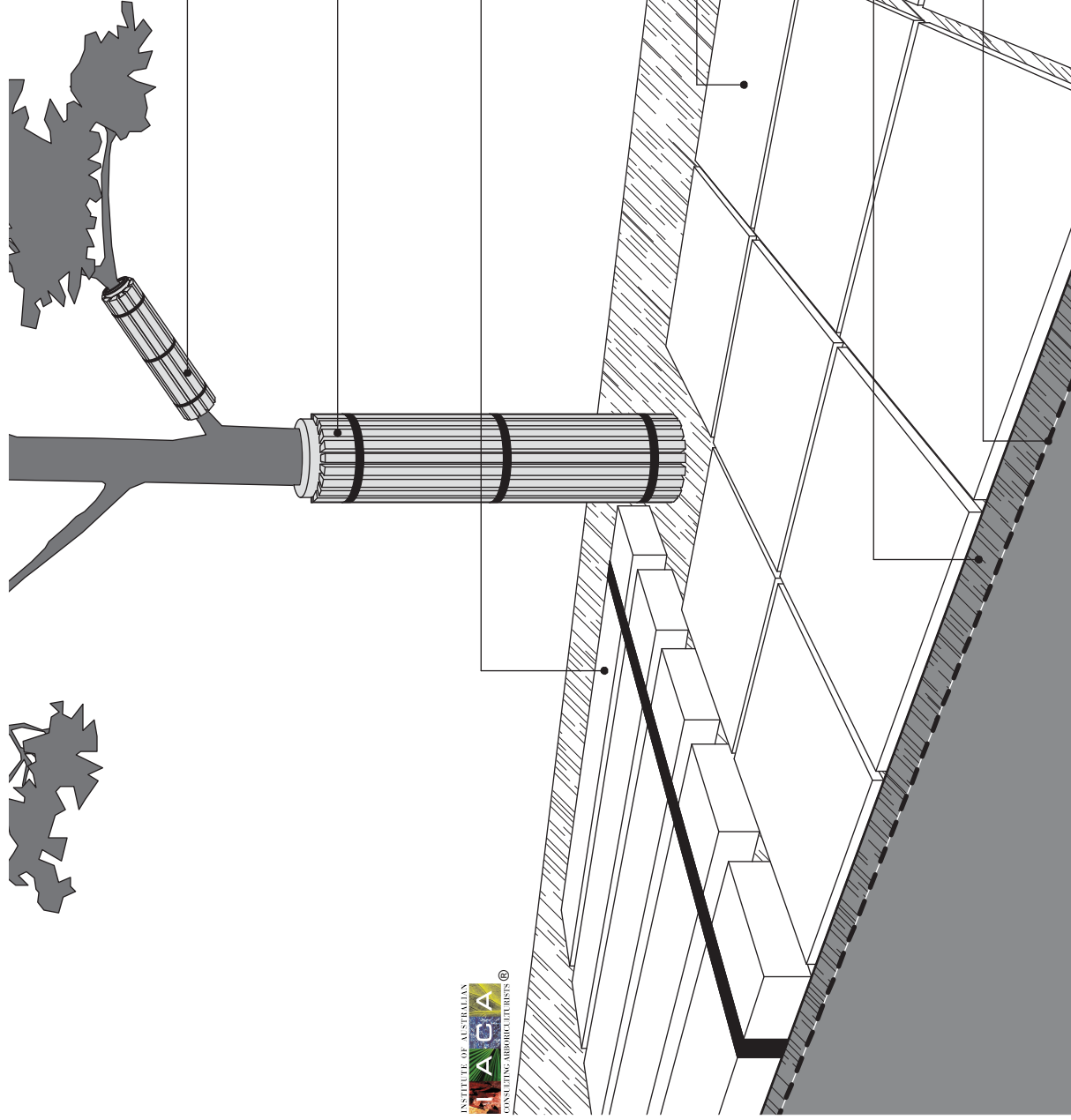
Tree Protection Zone (TPZ) sign

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.



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.

