



---

Project No: FASS/BUI/16 Report No: FASS/BUI/AIA/B

# ARBORICULTURAL IMPACT ASSESSMENT TREE PROTECTION SPECIFICATION

**Faculty of Arts and Social Science (FASS) Building  
University of Sydney**

Prepared for: LEND LEASE

21<sup>st</sup> June 2016  
Revision B

## Authors:

---

### Anna Hopwood

Grad. Cert (Arboriculture)  
Dip. Horticulture (Arboriculture)  
Dip. Horticulture (Landscape Design)

### Martin Peacock

BSc (hons.) Arboriculture  
Dip. Horticulture (Landscape Design)  
HN Dip. Arboriculture  
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



# Contents

<b>1.0</b>	<b>INTRODUCTION</b>	<b>3</b>
1.1	Background	3
<b>2.0</b>	<b>RESULTS</b>	<b>3</b>
2.1	The Site	3
2.2	The Proposal	4
2.3	The Trees	4
<b>3.0</b>	<b>ARBORICULTURAL IMPACT ASSESSMENT</b>	<b>5</b>
3.1	Trees 229, 230, 231, 232, 248 and 249	5
3.2	Trees 235 & 236	6
3.3	Group 240 (western end only) and Tree 1235	6
3.4	Tree 246	7
3.5	Tree 251	7
3.6	Underground Services	7
3.7	Replacement Planting	7
<b>4.0</b>	<b>CONCLUSION</b>	<b>8</b>
<b>5.0</b>	<b>LIMITATIONS &amp; DISCLAIMER</b>	<b>9</b>
<b>6.0</b>	<b>BIBLIOGRAPHY &amp; REFERENCES</b>	<b>10</b>
<b>7.0</b>	<b>APPENDICES</b>	<b>11</b>
	Appendix 1: Methodology	12
	Appendix 2: Plans	14
	Appendix 3: Tree Assessment Schedule	15
	Appendix 4: Plates	18
	Appendix 6: Tree Protection Specification	20
	Appendix 7: Typical Tree Protection Details	23

## 1.0 INTRODUCTION

### 1.1 Background

1.1.1 This Arboricultural Impact Assessment Report and Tree Protection Specification was prepared Lend Lease, on behalf of the University of Sydney, in relation to the R.D. Watt Building, J.R.A. McMillan Building and Agricultural Annex which is to be developed into a new Faculty of Arts and Social Science (FASS) Building within University's Camperdown Campus. The purpose of this Report is to determine the impact of the proposed works on the trees, and where appropriate, recommend the use of sensitive construction methods to minimise adverse impacts.

1.1.2 In preparing this report, the author is aware of and has taken into account the objectives of the City of Sydney's *Sydney Local Environmental Plan 2012, Development Control Plan 2012 (Section 3.5 Urban Ecology)*, University of Sydney's *Tree Management Plan (2016)*, *Australian Standard 4970 Protection of Trees on Development Sites (2009)*, *Australian Standard 4373 Pruning of Amenity Trees (2007)* and *Australian Standard 2303 Tree Stock for Landscape Use (2015)*.

1.1.3 This Report utilises the University's Tree Management Inventory Database (ArborPlan) numbering system.

Refer to Methodology (**Appendix 1**)

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

- Existing Site Plan (DA0002) issue C – prepared by Architectus (dated 10.06.16)
- Proposed Site Plan (DA0003) issue D – prepared by Architectus (dated 10.06.16)
- Level 1 Plan (DA10010) issue E – prepared by Architectus (dated 10.06.16)
- Level 2 Plan (DA1020) issue E – prepared by Architectus (dated 10.06.16)
- Level 3 Plan (DA1030) issue E – prepared by Architectus (dated 10.06.16)
- Level 4 Plan (DA1040) issue E – prepared by Architectus (dated 10.06.16)
- Level 5 Plan (DA1050) issue E – prepared by Architectus (dated 10.06.16)
- Level 6 Plan (DA1060) issue E – prepared by Architectus (dated 10.06.16)
- Landscape Plans FASS-L-DA-000 – 401 - prepared by Oculus (dated 16.06.16)

Refer to Plans (**Appendix 2**)

## 2.0 RESULTS

### 2.1 The Site

2.1.1 The site is a roughly rectangular-shaped area within the University of Sydney's, Camperdown Campus. The site is bound by Parramatta Road to the north, Science Road to the south, the Demountable Village to the west, and the Heydon-Laurence Building to the east.

2.1.2 The trees are located within landscape areas and garden beds throughout the site.

Refer to Tree Location Plan<sup>1</sup> (**Appendix 2**)

<sup>1</sup> ArborSafe Australia Pty Ltd (2013), *University of Sydney, ArborPlan Tree Inventory Assessments*.

## 2.2 The Proposal

---

2.2.1 This SSD application seeks approval for a new Faculty of Arts and Social Sciences Building referred to as 'FASS'. The FASS development will involve the construction of a new 6 level facility comprising:

- Plant rooms
- Computer laboratories and general teaching spaces
- Lecture theatre at the western end of the building
- Offices and meeting rooms
- Tutorial rooms and consultation rooms
- Various breakout spaces, informal lounges/seating, and facilities on each level
- Trafficable roof top terrace space

2.2.2 The following works are also proposed as part of the SSD application:

- Tree retention and removal within and surrounding the building footprint
- Hard and soft landscaping works including tree planting
- Civil works including excavation works to accommodate the building foundation and structures
- Utilities and infrastructure connections to the building
- Alterations and additions to the R.D Watt Building to facilitate uses that are complementary to the FASS development
- Building identification signage zones

2.2.3 The FASS Building will be connected to the R.D Watt Building by an awning across a linear courtyard that will function as an entry space to the new building.

2.2.4 It should be noted approval for the removal of Trees 233, 234, 237, 238, Group 240 (eastern end only), 247, 250, 775, 776, 777, 1154, 1176, 1177 and 1178 has been provided under REF 3 – 2016 – FASS Early Works Stage 2 (Camperdown Campus) and is not being sort under the SSD-7081 submission. These trees have not been included within Section 3 (Arboricultural Impact Assessment).

Refer to Plans (**Appendix 2**)

## 2.3 The Trees

---

2.3.1 Twenty five (25) trees were assessed in the preparation of this Report. All of the trees assessed are covered by the controls within *Section 3.5 Urban Ecology of Sydney Development Control Plan 2012*.<sup>2</sup>

2.3.2 Trees 229, 230, 231, 232, 248 and 249 are listed on the City of Sydney *Register of Significant Trees 2013*. The Register notes the trees have group significance in terms of aesthetic, visual, cultural and social value and would likely date from the Inter-War period.<sup>3</sup>

---

<sup>2</sup> City of Sydney (2012), *Development Control Plan 2012 (Section 3.5 Urban Ecology)*.

<sup>3</sup> City of Sydney (2013) *Register of Significant Trees*.

- 2.3.3 Group 240 and Tree 1235 have been identified as *Syzygium paniculatum* (Brush Cherry). A search of the BioNet Atlas of NSW Wildlife Database was undertaken in February 2016. This species is listed as *Endangered* under the NSW *Threatened Species Conservation Act (1995)* and *Vulnerable* under the commonwealth *Environment Protection and Biodiversity Conservation Act (1999)*.<sup>4</sup> Based on the formality of the planting, tree age, size and location, it is evident that Group 240 and Tree 1235 are planted specimens. In addition, an ecological assessment of the University was conducted in 2013 and determined that no threatened flora species or threatened ecological communities exist on the Camperdown and Darlington Campuses.<sup>5</sup> The ecological significance and habitat value of the trees has not been assessed and is beyond the scope of this report.
- 2.3.4 Further detail on the assessment of the trees is provided in the Tree Assessment Schedule (**Appendix 3**) and Preliminary Arboricultural Report (February 2016).

### 3.0 ARBORICULTURAL IMPACT ASSESSMENT

#### 3.1 Trees 229, 230, 231, 232, 248 and 249

- 3.1.1 Trees 229, 230, 231, 232, 248 and 249 have been identified as *Lophostemon confertus* (Brush Box) and are located within retained garden beds fronting Science Road. In general, the trees are in good health and structural condition. The trees have an estimated Useful Life Expectancy (ULE) of 15-40 years, and have been allocated a very high Landscape Significance and a Retention Value of *Priority for Retention*. Tree 230 is in fair health due to dieback in upper crown, and the presence of small (<25mm) diameter deadwood and small (<25mm) diameter epicormic growth.
- 3.1.2 The supplied plans show that Trees 229, 231, 232, 248 and 249 are proposed for retention as part the proposed development. Tree 230 is proposed for removal to accommodate a new access to service the FASS Building.
- 3.1.3 The supplied plans show that Tree 229 will be subject to TPZ encroachment from the sandstone wall reconstruction. These works represents a *Minor Encroachment* (less than 10% of the TPZ) 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.
- 3.1.4 The supplied plans show that Tree 231 will be subject to a TPZ encroachment of approximately 18% from the construction of the new access from Science Road and insitu concrete walls. In addition, sandstone wall reconstruction and minor grading will be required between the existing steps on the footpath fronting the R.D Watt Building and the new access way to the east of the R. D Watt Building.
- 3.1.5 The supplied plans also show that demolition works, sandstone wall reconstruction, and the installation of insitu concrete walls, stairs, pavements and soft landscaping is proposed within the TPZ areas of Trees 229, 231, 232, 248 and 249. The extent of work represents *Major Encroachments* as defined by AS-4970.
- 3.1.6 **Recommendations** – In accordance with Clause 3.3.4 of AS-4970, the following tree sensitive demolition/construction methods should be used to minimise the impact of works on Trees 229, 231, 232, 248 and 249.
- **Demolition Works:** Tree sensitive methods should be used for the removal of existing structures and pavements within TPZ areas. Where possible, existing footings and sub-base materials should be left in situ and reused. The existing sandstone wall fronting Science Road should be left in situ (where possible) to ensure the stability of the trees' rootplates is maintained.

<sup>4</sup> NSW Office of Environment and Heritage's Atlas of NSW Wildlife (2011), *BioNet Atlas of NSW Wildlife*.

<sup>5</sup> Australian Museum Consulting (2013), *University of Sydney Ecological Assessment*.

- Access/Walls/Stairs: Hand excavation and root pruning should be undertaken along the line of the proposed access/walls/stairs prior to the commencement of mechanical excavation to prevent shattering of roots by excavation equipment. Root pruning should be undertaken by the Project Arborist only.

New walls within TPZ areas should be designed and constructed as to avoid the requirement for over-excavation. Where standard drainage (i.e. slotted ag pipe and aggregate drainage) is proposed to the rear of walls, these materials should be substituted for a slimline draincell type product to reduce the requirement for additional excavation.

New wall footings for the insitu concrete walls/reconstructed sandstone walls should be modified to bridge significant roots (as determined by the Project Arborist).

- Grading/Pavement Installation: Grading between the existing steps on the footpath fronting the R.D Watt Building and the new access way to the east of the R. D Watt Building supervised by the Project Arborist, and be undertaken in small increments using a compact excavator fitted with a flat bladed bucket. Pavement sub-base layers should be either, thinned or finished pavement levels amended to enable the retention of significant roots (as determined by the Project Arborist).
- Plant Installation: The installation of plants within TPZ areas should be undertaken using hand tools and roots (>25mmØ) should be protected. No mechanical cultivation/ripping of soils should be undertaken within TPZ areas. Other than the installation of soil conditioners to a maximum depth of 50mm above the existing soil profile, excavation and installation of new, imported soil mixes should be excluded from TPZ areas.

### 3.2 Trees 235 & 236

---

3.2.1 Trees 235 and 236 have been identified as *Plumeria acutifolia* (Frangipani) and *Jacaranda mimosifolia* (Jacaranda), and are located to the north-east of the R.D Watt Building. The trees are in good health, and good to fair structural condition. The trees have an estimated ULE of 15-40 years, and have been allocated a moderate Landscape Significance and a Retention Value of *Consider for Retention*.

3.2.2 The trunk of Tree 236 bifurcates at just above ground level into two stems of 400mm and 300mm diameter. A minor co dominant inclusion is present between the stems. Whilst this bark inclusion does not represent a significant structural defect in the short to medium term, over time as the stems increase in diameter, this inclusion may become more significant.

3.2.3 The supplied plans show Trees 235 and 236 are proposed for removal as part of the landscape treatment.

### 3.3 Group 240 (western end only) and Tree 1235

---

3.3.1 Group 240 and Tree 1235 have been identified as *Syzygium paniculatum* (Bush Cherry) and are located in a garden bed areas fronting Parramatta Road. The trees are in good health and structural condition. Group 240 are growing as a closely planted double row which provides a screen between the University and Parramatta Road. Due to the proximity of the rows to one another, the inner crowns of the trees are heavily suppressed. Group 240 and Tree 1235 have been allocated a moderate Landscape Significance and a Retention Value of *Consider for Retention*.

3.3.2 The supplied plans show Group 240 (western end only) and Tree 1235 are proposed for removal to accommodate the new FASS Building and associated landscape treatment.

### 3.4 Tree 246

---

- 3.4.1 Tree 246 has been identified as *Jacaranda mimosifolia* (Jacaranda) and is located directly south of the entry to the R.D Watt Building. The tree is in good health and structural condition, with an estimated ULE of 15-40 years. Tree 246 has been allocated a high Landscape Significance and a Retention Value of *Priority for Retention*.
- 3.4.2 The supplied plans show works no works are proposed within the TPZ of Tree 246.

### 3.5 Tree 251

---

- 3.5.1 Tree 251 has been identified as *Liquidambar formosa* (Oriental Liquidambar) and is located to the west of the R.D Watt Building. The tree is in good health and fair structural condition. The tree has an estimated ULE of 15-40 years, and has been allocated a moderate Landscape Significance and a Retention Value of *Consider for Retention*.
- 3.5.2 Tree 251 has developed a moderate phototropic trunk lean as a result of being planted in close proximity to the R.D Watt Building. The tree is in the early stages of maturity and has the potential to become much larger with a broad spreading crown. The limited clearance from the adjacent building will cause the tree to develop a highly asymmetric crown form and periodic pruning will be required to maintain building clearances.
- 3.5.3 The supplied plans show Tree 251 is proposed for removal to enable the installation of retaining walls and terracing.

### 3.6 Underground Services

---

- 3.6.1 The installation of underground services should be located outside of TPZ areas. Where this is not possible, they should be installed using either hydrovac or hand excavation methods with the services located around/below roots (>25mm $\varnothing$  or as determined by the Project Arborist). Alternatively, boring methods may be used for underground service installation where the installation depth is greater than 800mm below existing grade. Excavations for starting and receiving pits for boring equipment should be located outside of TPZ areas or located to avoid roots (>25mm $\varnothing$  or as determined by the Project Arborist).

### 3.7 Replacement Planting

---

- 3.7.1 Replacement tree planting should be installed as part of the works. Replacement trees should be supplied as advanced-size stock to help offset the loss of amenity resultant from the tree removals.
- 3.7.2 Replacement planting should be supplied in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use* and the University of Sydney's *Tree Management Plan (2016)*.
- 3.7.3 Sufficient soil volumes should be provided for the new tree plantings to support healthy tree growth over a long-time frame. Wherever possible, isolated planting areas should be increased in size or linked below pavement surfaces to adjacent planting areas to maximize the available growing environment. Various products are available which can be used beneath pavement surfaces to provide adequate support for the pavement whilst providing a suitable growing environment for tree roots. In addition, research shows that the use of tree friendly paving products can significantly reduce pavement damage and maintenance costs over the long term.

## 4.0 CONCLUSION

- 4.1 Twenty five (25) trees were assessed in the preparation of this Report. Trees 229, 230, 231, 232, 248 and 249 are listed on Council's *Register of Significant Trees 2013*.
- 4.2 The SSD application seeks approval for a new Faculty of Arts and Social Sciences Building referred to as 'FASS'. The FASS development will involve the construction of a new 6 level facility and associated works. Approval for the removal of Trees 233, 234, 237, 238, Group 240 (eastern end only), 247, 250, 775, 776, 777, 1154 1176, 1177 and 1178 has been provided under REF 3 – 2016 – FASS Early Works Stage 2 (Camperdown Campus) and is not being sort under the SSD-7081 submission.
- 4.3 The supplied plans show that Trees 230, 235, 236, 240 (western end only), 251 and 1235 are proposed for removal as part of the development.
- 4.4 The supplied plans show that Trees 229, 231, 232, 246, 248 and 249 are to be retained as part of the proposed development. In accordance with Clause 3.3.4 of AS-4970, tree sensitive demolition/construction methods should be used to minimise the impact of works on the trees. Refer to Tree Protection Specification (**Appendix 5**). A comprehensive Tree Protection Plan should be prepared by an AQF Level 5 Arborist on finalisation of the construction drawings.
- 4.5 Replacement planting is recommended where trees are proposed for removal. New tree plantings should be supplied in accordance with *Australian Standard 2303 (2015) Tree Stock for Landscape Use* and the University of Sydney's *Tree Management Plan (2016)*.

## 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 viewed 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.

This Report is based on Standards Australia Ltd copyrighted material that is distributed by SAI Global Ltd on Standards Australia Ltd's behalf. It may be reproduced and modified in accordance with the terms of SAI Global Ltd's Licence 1110-c049 to TreeiQ ('the Licensee'). All amended, marked-up and licensed copies of this document must be obtained from the Licensee. Standards Australia Ltd's copyright material is not for resale, reproduction or distribution in whole or in part without written permission from SAI Global Ltd: tel +61 2 8206 6355 or [copyright@saiglobal.com](mailto:copyright@saiglobal.com)

ArborSafe Australia Pty Ltd (2013). *University of Sydney, ArborPlan Tree Inventory Assessments*.

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.

City of Sydney (2013) *Development Control Plan*

[www.cityofsydney.nsw.gov.au/development/planning-controls/development-control-plans](http://www.cityofsydney.nsw.gov.au/development/planning-controls/development-control-plans) (website accessed Dec, 2013)

City of Sydney (2013) *Register of Significant Trees*

[http://www.cityofsydney.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0007/143395/130617\\_EC\\_ITEM05\\_ATTACHMENT4.PDF](http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0007/143395/130617_EC_ITEM05_ATTACHMENT4.PDF)

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

Matheny & Clark (1994), *A Photographic Guide to the Evaluation of Hazard Trees in Urban Areas*, 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*.

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

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

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

TreeiQ (2016), *University of Sydney Tree Management Plan*.



## Appendix 1: Methodology

---

- 1.1 Site Inspection:** This report was determined as a result of a comprehensive site during February 2016. 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 assessed using the Visual Tree Assessment criteria and notes as described in *The Body Language of Trees – A Handbook for Failure Analysis*.<sup>6</sup> 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.
- 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 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. 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

---

<sup>6</sup> Mattheck & Breloer (2003)

**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 Significant Tree Register or is considered to meet 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.
	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 has been identified by a suitably qualified professional as a species scheduled as a Threatened or Vulnerable Species or forms part of an Endangered Ecological Community associated with the subject site, as defined 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 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.
Insignificant	The subject tree is declared a Noxious Weed under the Noxious Weeds Act

**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			

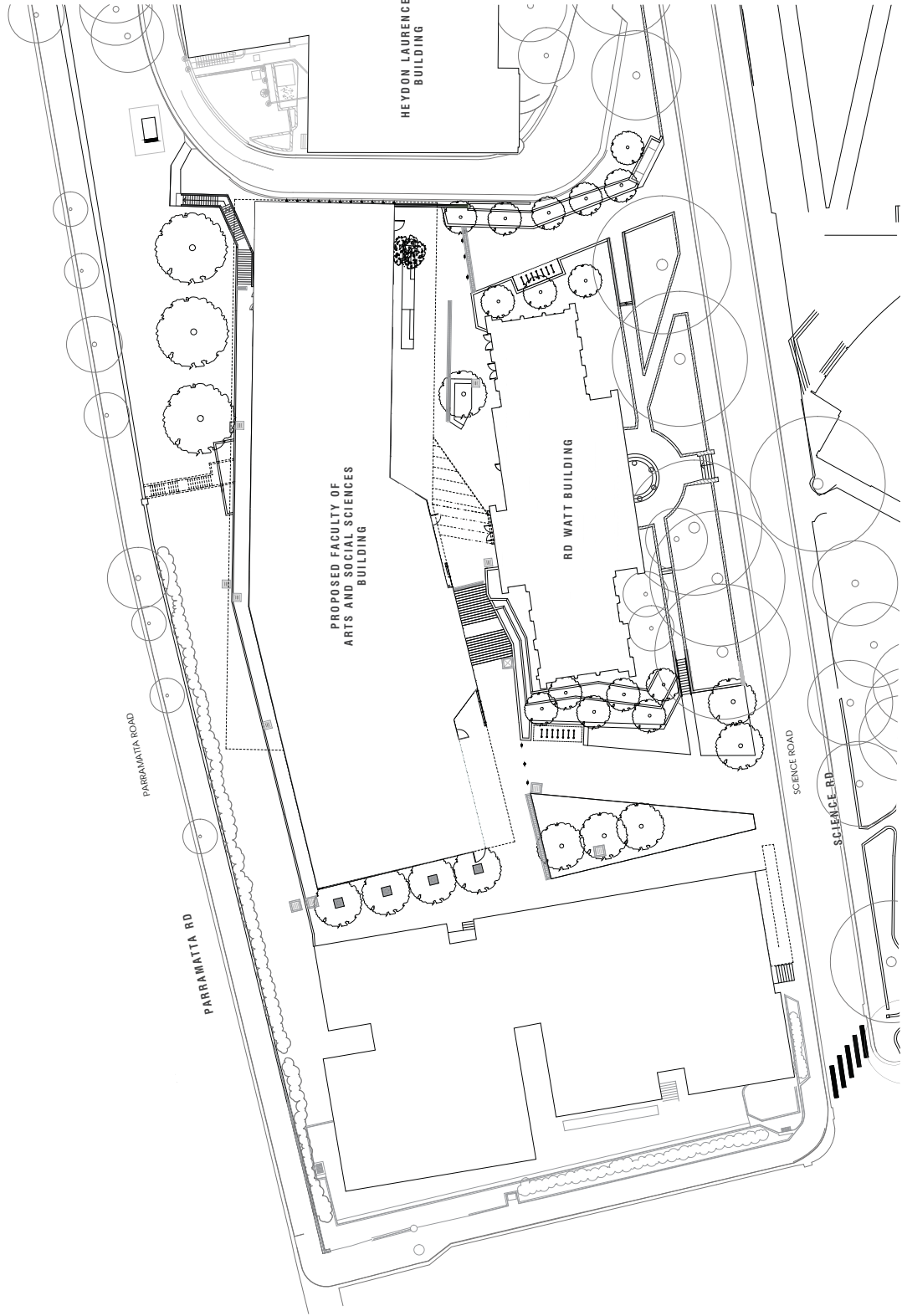
The above table has been modified from the Footprint Green Tree Significance and Retention Value Matrix.





# FACULTY OF ARTS AND SOCIAL SCIENCES UNIVERSITY OF SYDNEY

DEVELOPMENT APPLICATION (SSD - 7081)



## DRAWING SCHEDULE

DWG NUMBER	TITLE
FASS-LDA-000	COVER SHEET
FASS-LDA-100	LANDSCAPE PLAN - GROUND
FASS-LDA-101	TREE PROTECTION / REMOVAL PLAN
FASS-LDA-110	LANDSCAPE FINISHES PLAN - GROUND
FASS-LDA-120	LANDSCAPE PLAN - ROOF
FASS-LDA-121	LANDSCAPE FINISHES PLAN - ROOF
FASS-LDA-200	LANDSCAPE SECTIONS 1
FASS-LDA-201	LANDSCAPE SECTIONS 2
FASS-LDA-202	LANDSCAPE SECTIONS 3
FASS-LDA-203	LANDSCAPE SECTIONS 4
FASS-LDA-204	LANDSCAPE SECTIONS 5
FASS-LDA-400	PLANTING AND MATERIAL IMAGES - GROUND
FASS-LDA-401	PLANTING IMAGES - ROOF & PLANTING SCHEDULES



EXISTING STAIR  
REMOVED

HERITAGE  
INTERPRETATION  
OF SUBSTATION

HEDGE PLANTING

MASS PLANTING  
GRAVEL  
MAINTENANCE  
PATH

TREE PLANTING

GRANITE STAIRS

CLASS 2 INSITU CONCRETE  
WALL

BICYCLE PARKING X 7

GRANITE FLAGSTONE PAVING

CLASS 2 IN SITU CONCRETE  
SEATING EDGE

CLASS 2 INSITU CONCRETE  
WALL

RAISED TURF PLATFORM  
WITH CORTEN STEEL  
EDGE

MASS PLANTING  
ELECTRICAL KIOSK

TREE PLANTING

EGRESS STAIR

PROPOSED BUILDING ENTRY

GRANITE FLAGSTONE PAVING

MASS PLANTING BED  
& FEATURE TREE WITH CLASS 2 INSITU  
CONCRETE SEATING EDGE

BICYCLE PARKING X 7

CLASS 2 INSITU  
CONCRETE WALLS

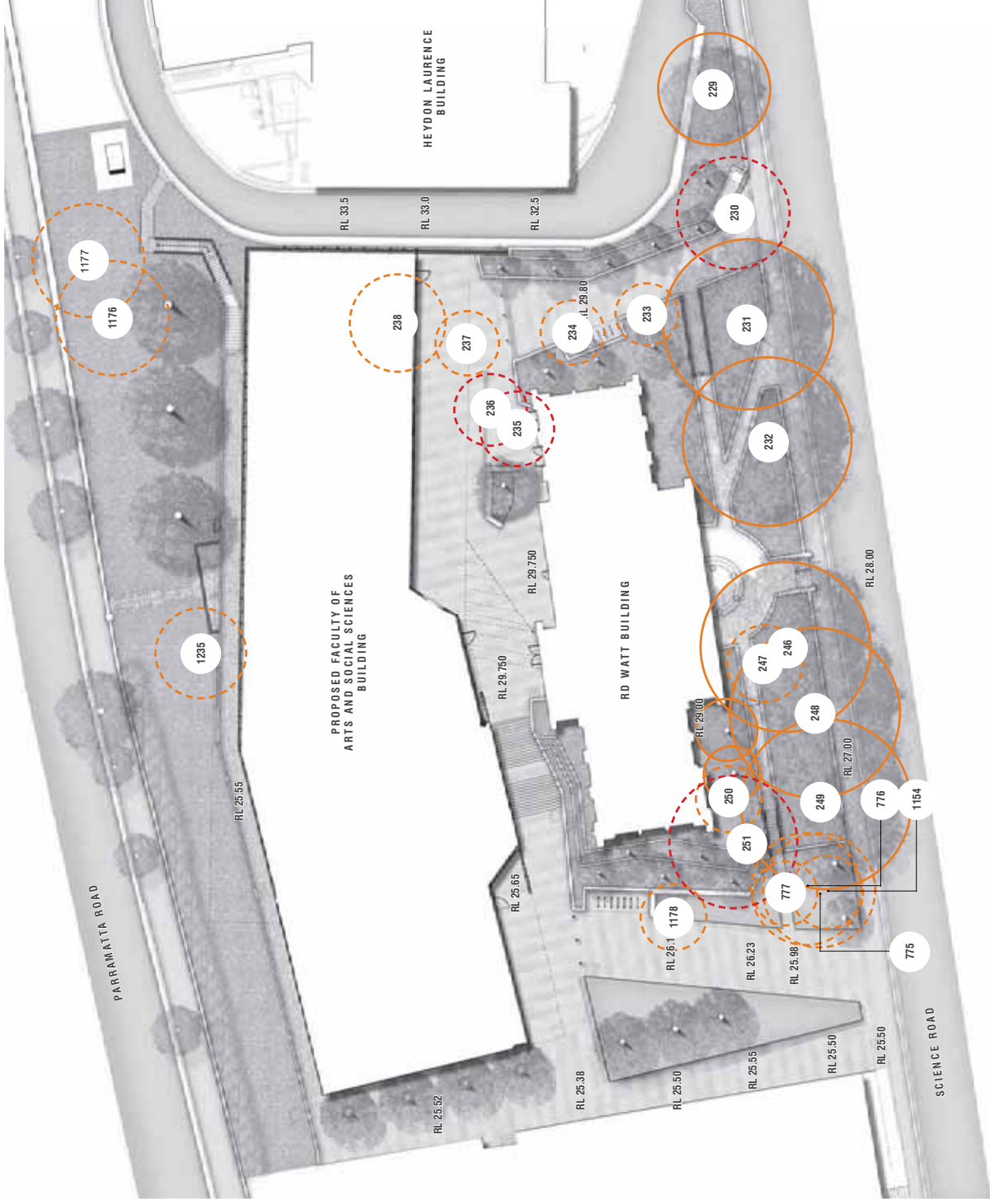
FIRE BOOSTER VALVES, GAS & WATER  
METERS

ACCESSWAY PAVED IN  
GRANITE FLAGSTONES

NEW SANDSTONE WALLS

NEW SANDSTONE WALLS

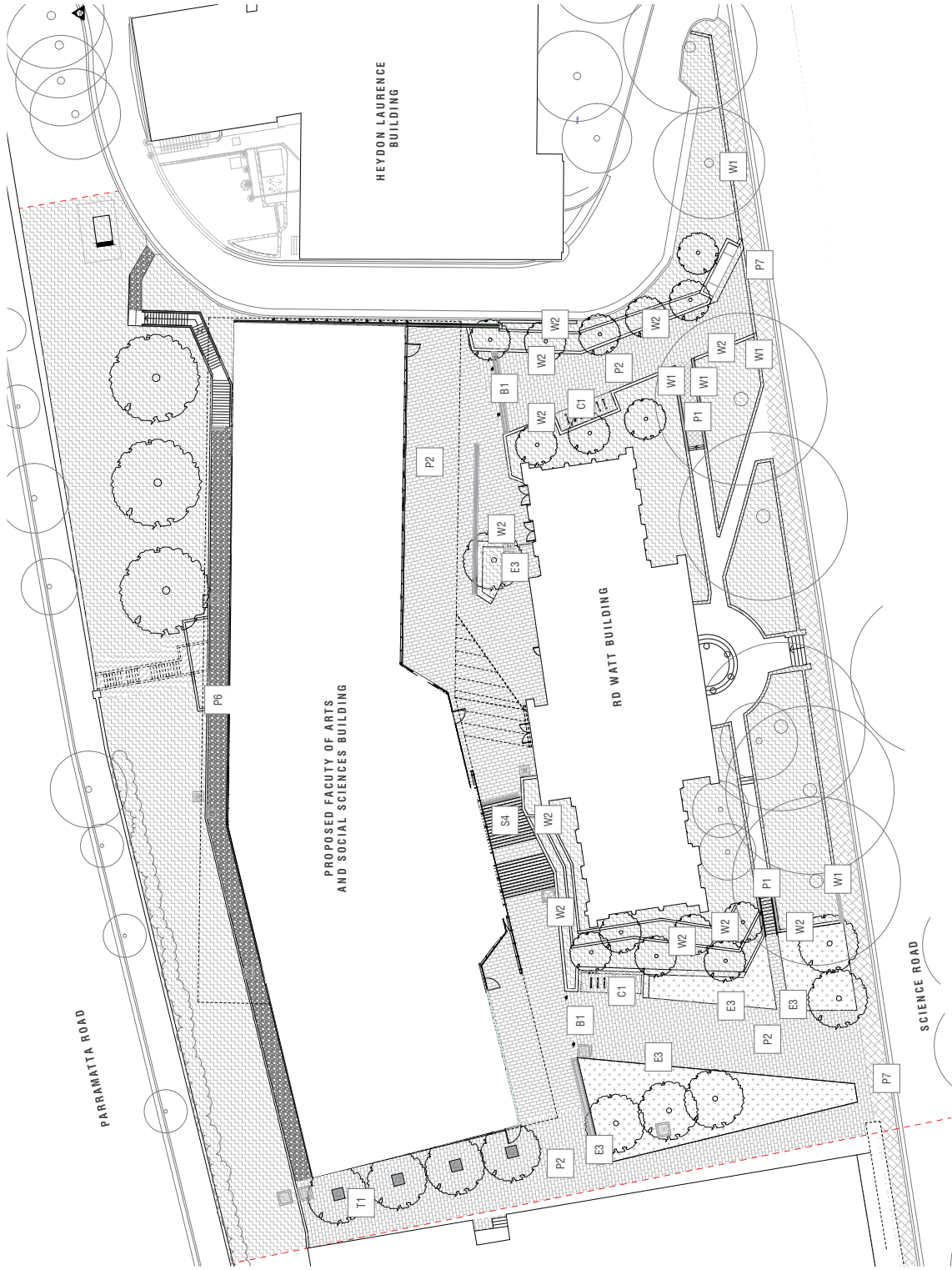
CLASS 2 INSITU  
CONCRETE WALLS



**LEGEND**

- EXISTING TREES RETAINED AND PROTECTED
- EXISTING TREES REMOVED UNDER REFS -2016 -FASS EARLY WORKS STAGE 2, CAMPERDOWN CAMPUS
- EXISTING TREES REMOVED UNDER S.S.D.A

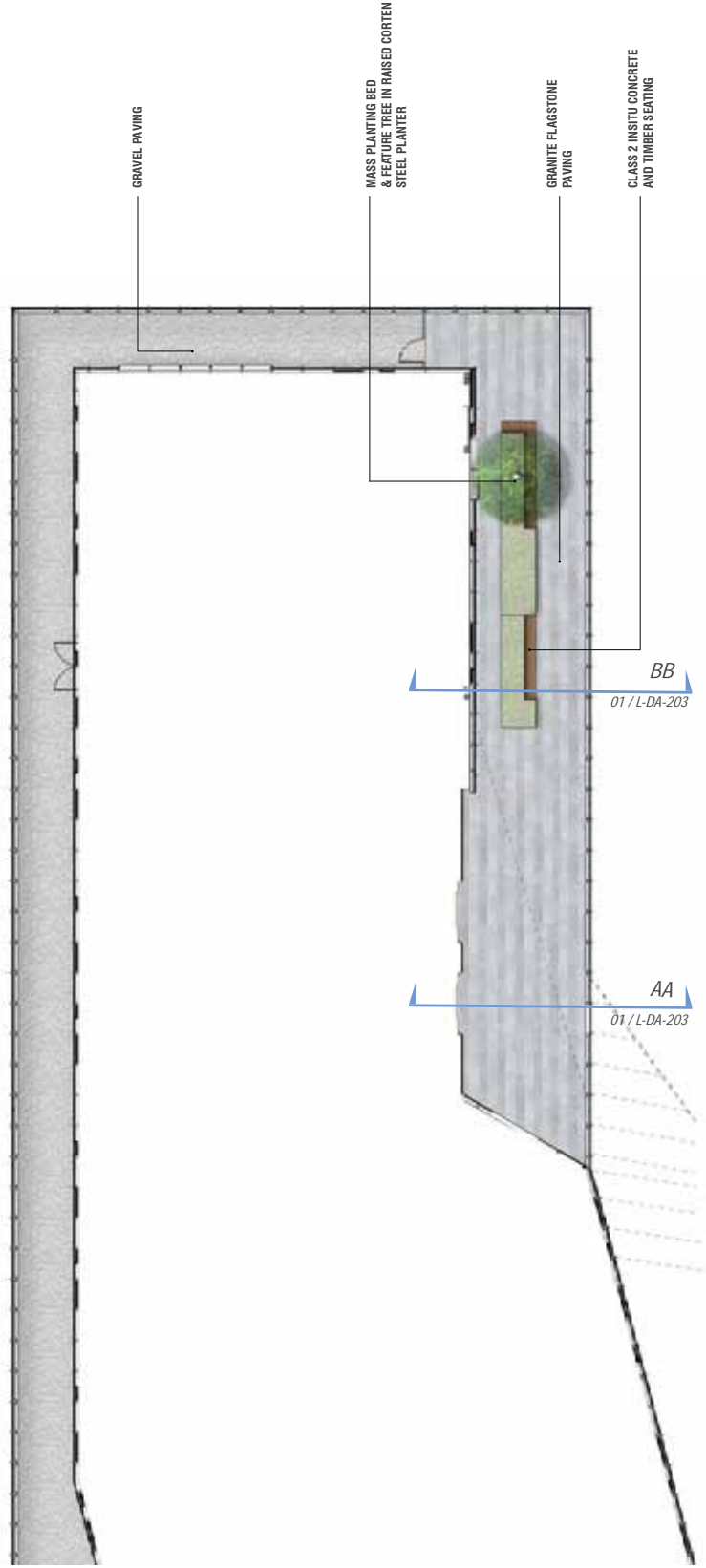
NOTE: REFER TO A1A PREPARED BY TREE IQ

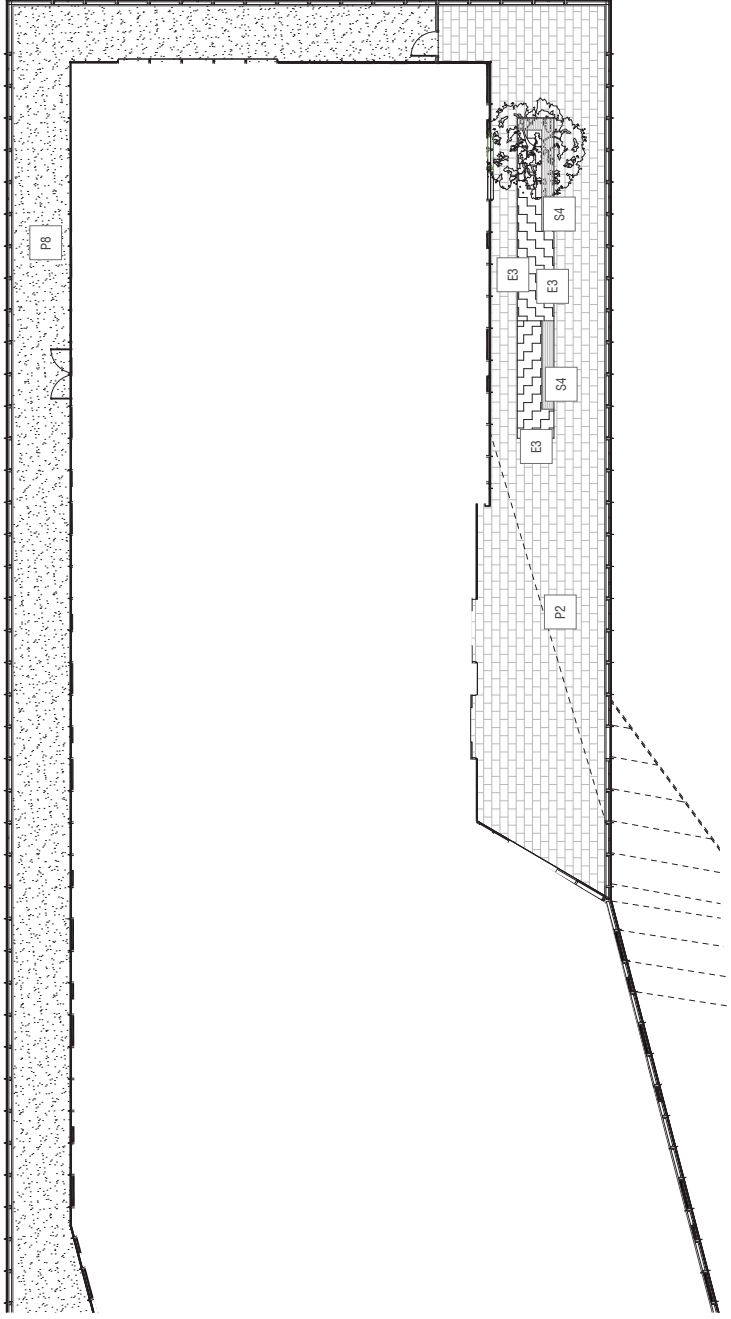







**LEGEND:**

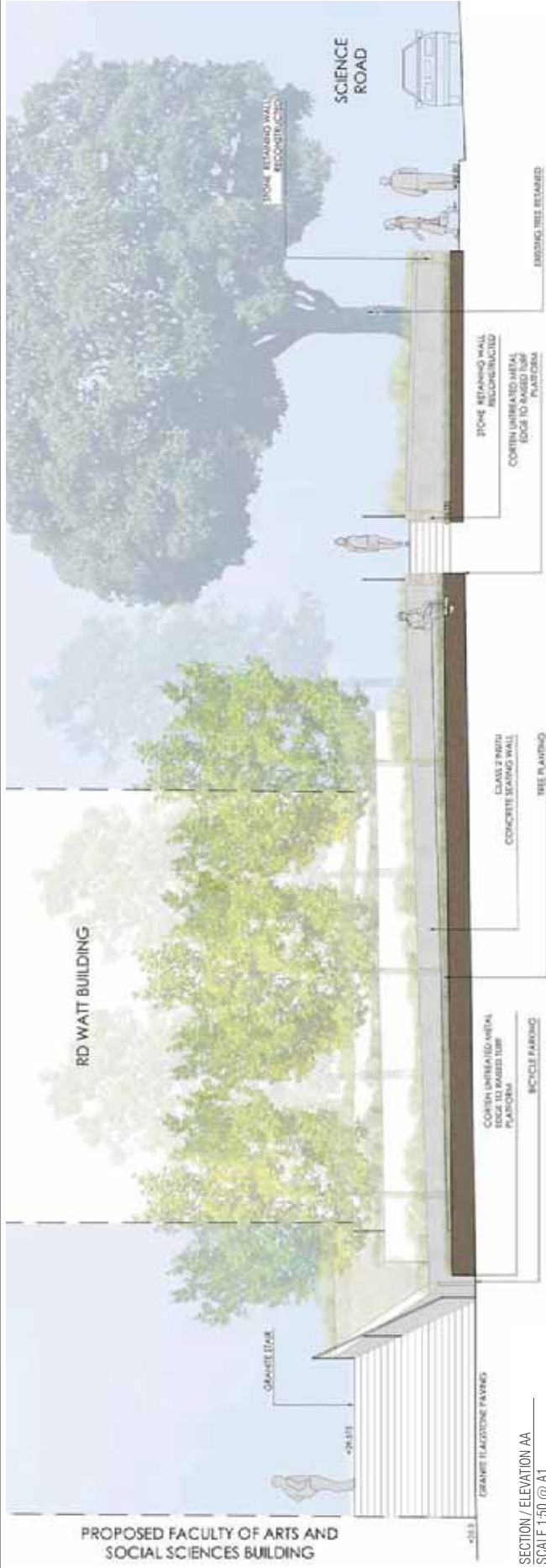
- PROPOSED TREE
- EXISTING TREE REMOVED
- EXISTING TREE RETAINED
- TURF
- MASS PLANTING
- P2 GRANITE FLAGS
- P1 INSITU CONCRETE PAVING
- P6 DECOMPOSED GRANITE PATH
- P7 ASPHALTIC CONCRETE ROAD SURFACES
- P8 GRAVEL
- S4 GRANITE STAIRS
- E3 UNTREATED STEEL EDGING
- EXISTING SANDSTONE WALLING
- W1 RECONSTRUCTED SANDSTONE WALLING
- W2 INSITU CONCRETE CUSTOM WALL
- T1 TREE SURROUND
- C1 CYCLE RACK

REV.	DATE	BY	CHKD.	REASON
01	15.06.16	LANDSCAPE ARCHITECT	B	ISSUED FOR PERMIT APPLICATION
02	15.06.16	LANDSCAPE ARCHITECT	B	ISSUED FOR PERMIT APPLICATION
03	15.06.16	LANDSCAPE ARCHITECT	C	ISSUED FOR PERMIT APPLICATION



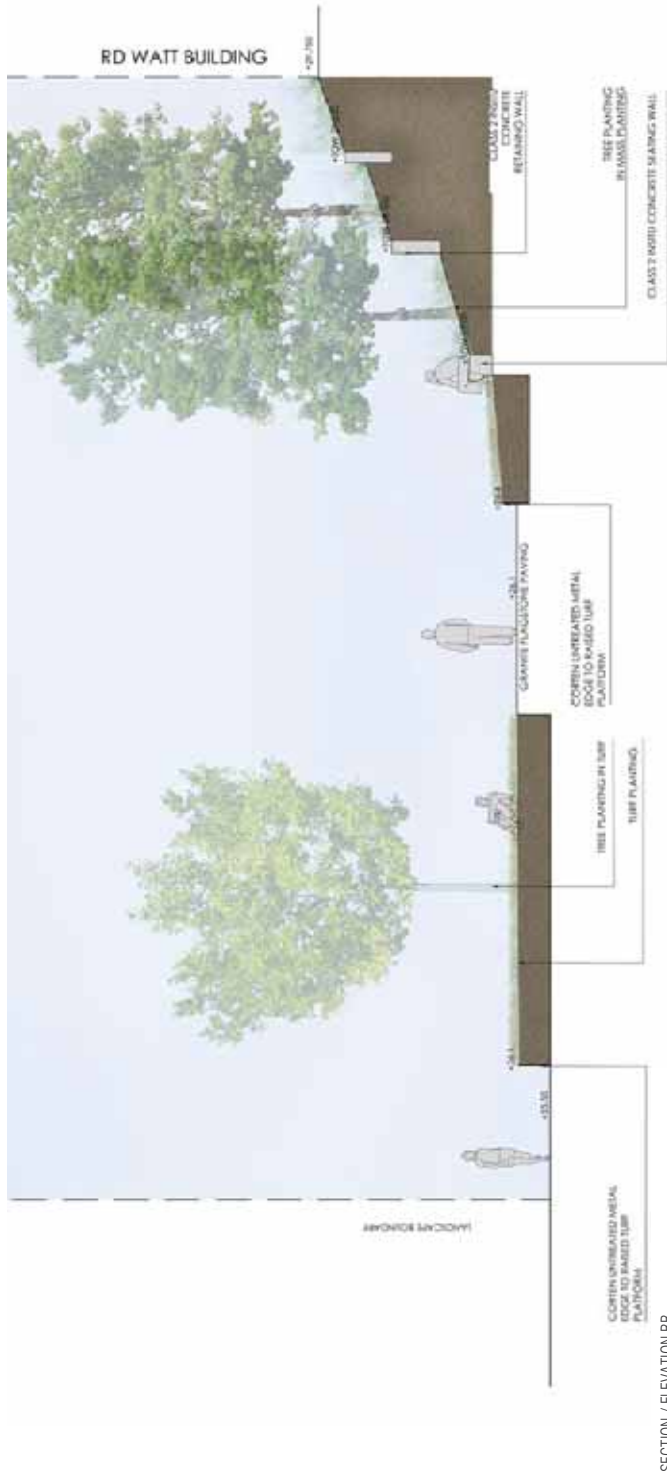


-  P8 GRAVEL
-  P2 GRANITE FLAGS
-  E3 UNTREATED STEEL EDGING
-  S4 CUSTOM SEATING STEEL AND HARDWOOD TIMBER SEAT
-  PROPOSED TREE



PROPOSED FACULTY OF ARTS AND SOCIAL SCIENCES BUILDING

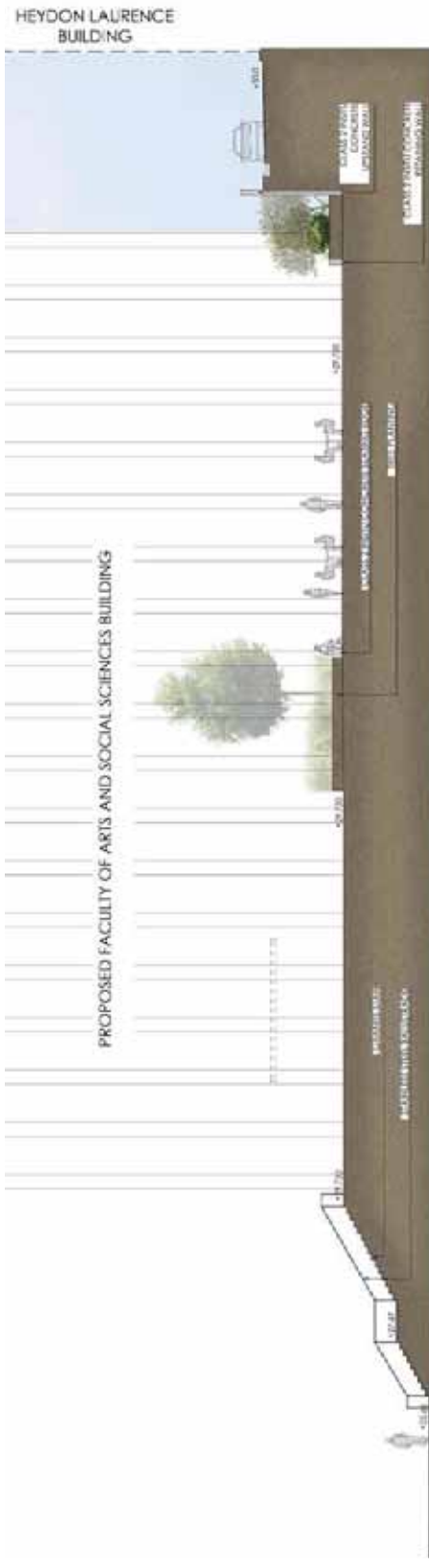
SECTION / ELEVATION AA  
SCALE 1:50 @ A1



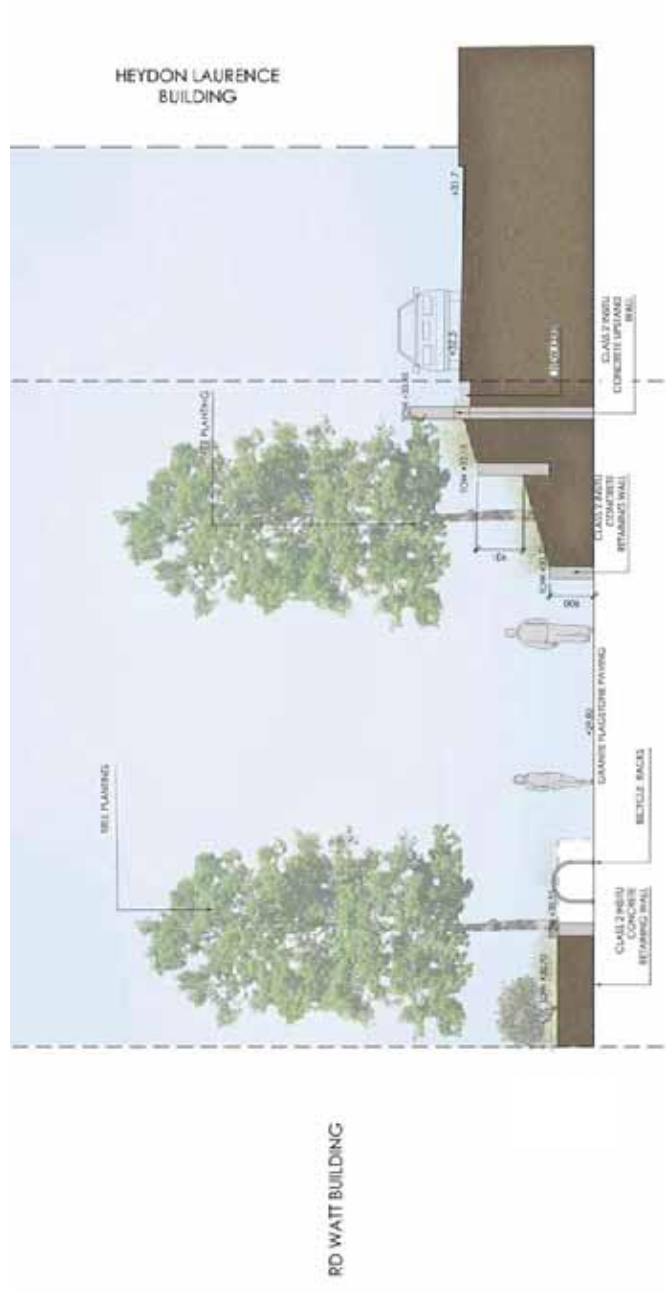
SECTION / ELEVATION BB  
SCALE 1:50 @ A3

REV.	DATE	STATUS	BY	CHKD	STATUS
01	10.06.16	ISSUED FOR PERMIT	B		
02	10.06.16	ISSUED FOR PERMIT	B		
03	16.06.16	ISSUED FOR PERMIT	C		

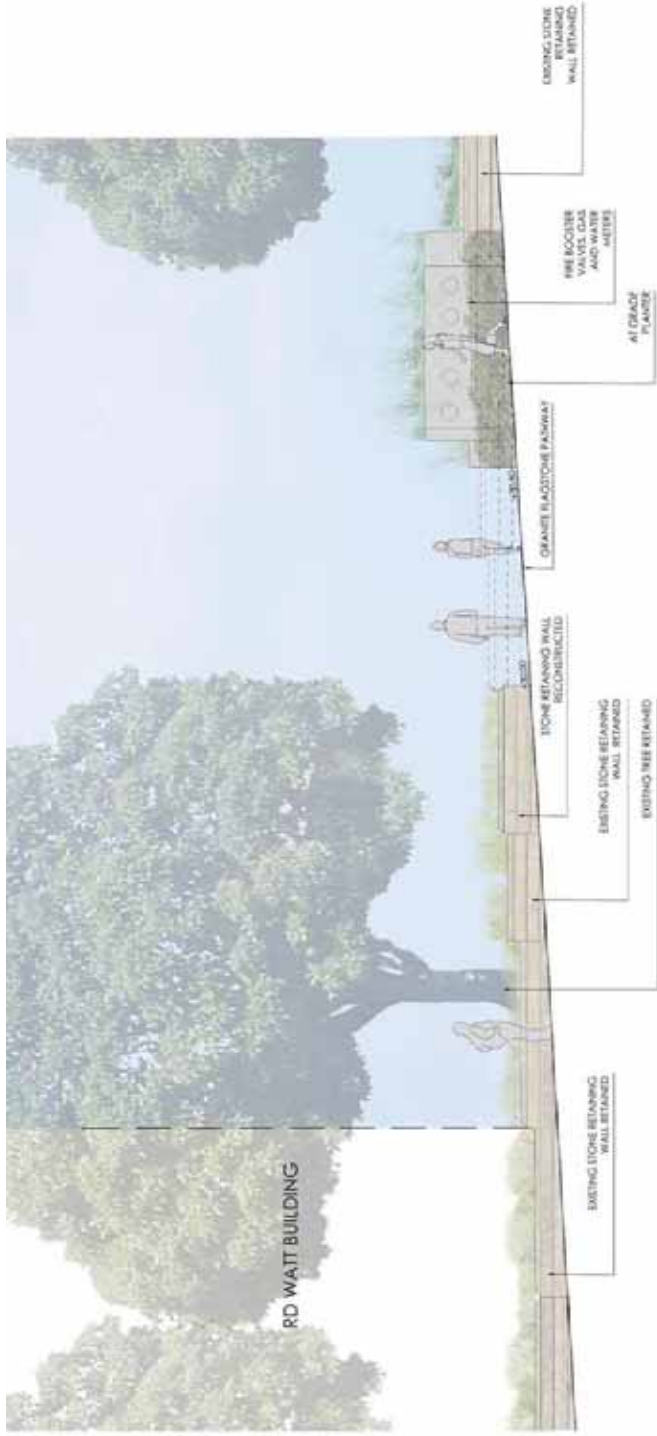




ELEVATION CC  
SCALE 1:100 @ A1



ELEVATION DD  
SCALE 1:30 @ A1



ELEVATION EE  
SCALE 1:50 @ A1

REV.	DATE	BY	CHKD.	STATUS
01	10.06.16	LANDSCAPE ARCHITECT	B	
02	15.06.16	LANDSCAPE ARCHITECT	C	



O C U L U S  
level 11, 5 Wilson St / northtown new 2042  
p 02 9557 5533 sydney@oculus.info

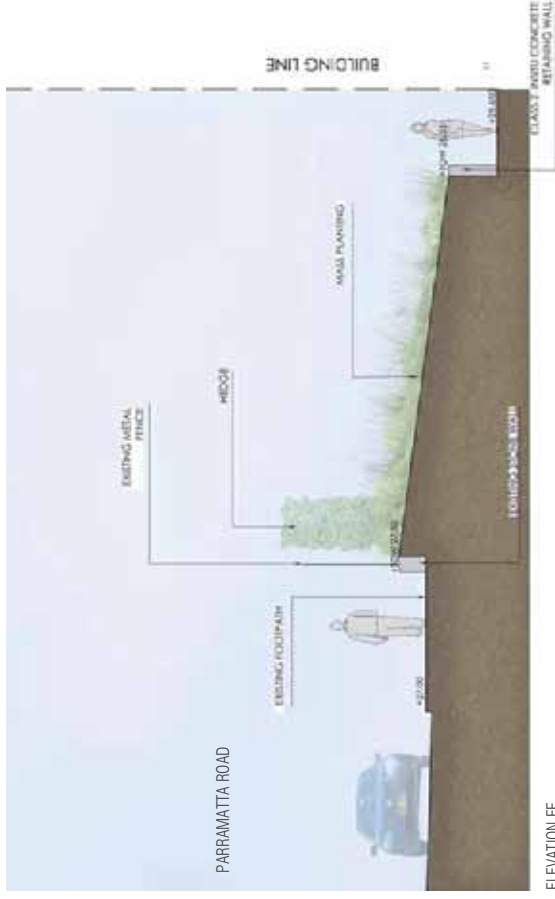
FASS - UNIVERSITY OF SYDNEY  
LANDSCAPE SECTIONS

job no.: S15-047  
date: 16-06-2016

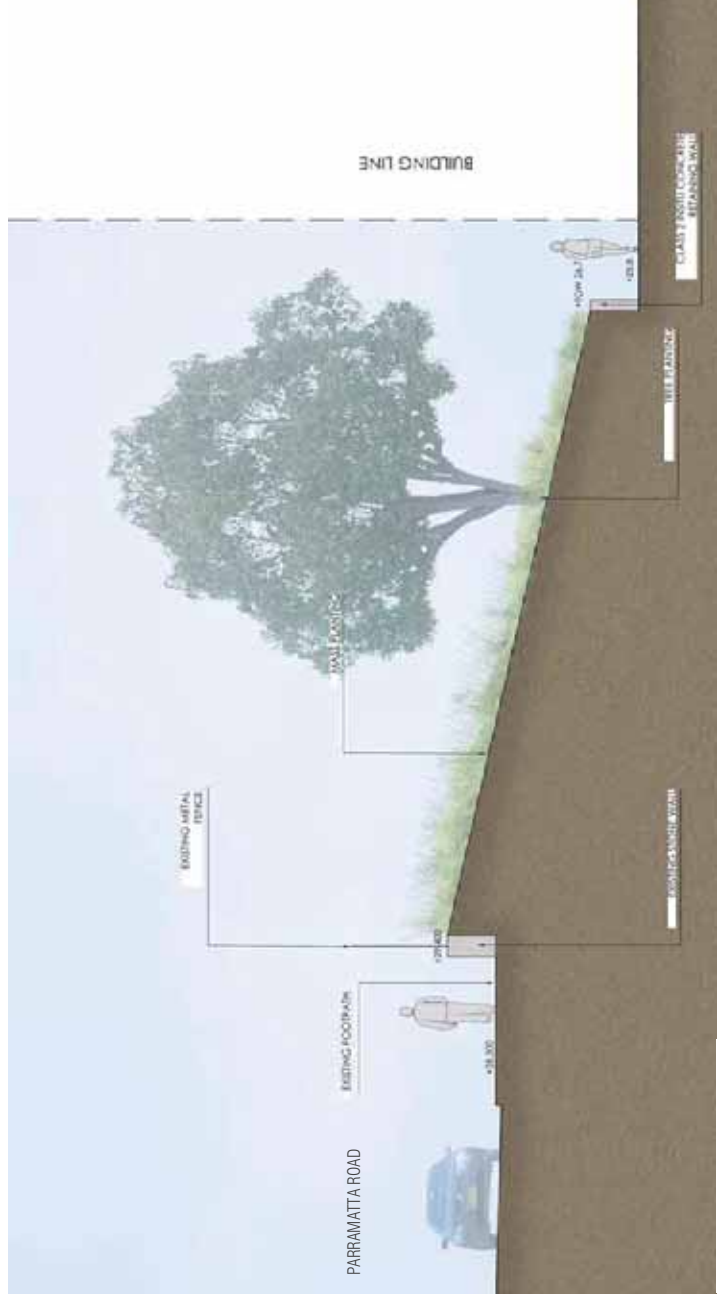
drawn by: DW  
checked: KS



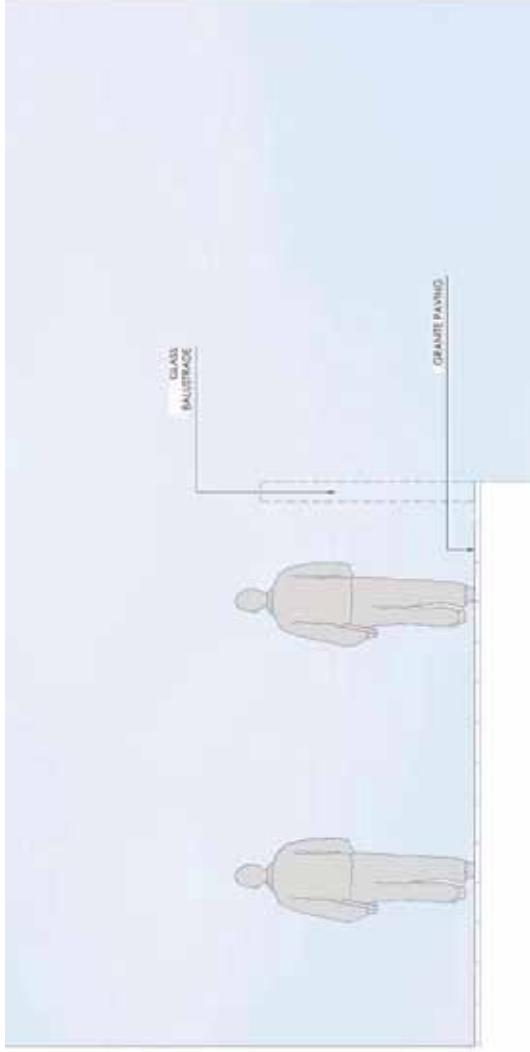
FASS-L-DA-202 C



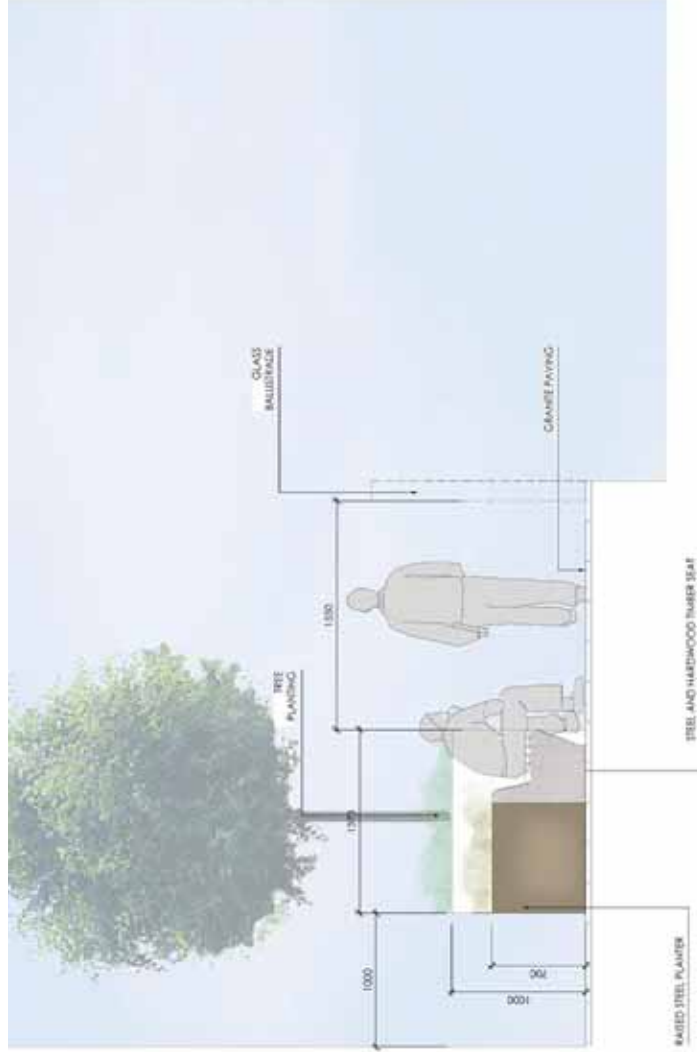
ELEVATION FF  
SCALE 1:50 @ A1



ELEVATION GG  
SCALE 1:50 @ A1

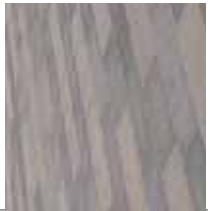


ELEVATION FF  
SCALE 1:50 @ A1



ELEVATION GG  
SCALE 1:50 @ A1

**MATERIALS**



P2 - GRANITE FLAGS



P7 - ASPHALTIC CONCRETE ROAD SURFACES S4 - GRANITE STEPS



E3 - UNTREATED STEEL EDGING



B1 - STANDARD BOLLARD



W1 - CUSTOM SANDSTONE WALL



W2 - IN SITU CONCRETE CUSTOM WALL



C1 UNIVERSITY STANDARD RACK T1 - TREE PIT SURROUND



**TREE PLANTING - GROUND LEVEL**



*Eucalyptus reticulatus*



*Ficus rubiginosa*



*Ficus microcarpa var hillii*



*Ginkgo biloba*



*Quercus palustris*



*Tristramopsis laurina*



*Waterhousea floribunda*

**MASS PLANTING - GROUND LEVEL**



*Acanthus mollis*



*Liriope muscari* 'Evergreen Giant'



*Azalea indica* 'Pink'



*Buxus microphylla japonica*



*Clivia miniata*



*Cycas revoluta*



*Camellia sasanqua*



*Calathea zebrina*



*Dianella caerulea*



*Hydrangea quercifolia*



*Lomandra longifolia* 'Tanker'



*Neomeris gracilis*



*Pennisetum alopecuroides*



*Poa latifolliardi*



*Philodendron vaitupu*



*Trachelogasterum jasminoides*



*Viola hederaea*

# TREE PLANTING - ROOFTOP



Backhousia citrifolia

## PLANT SCHEDULE - GROUND

Symbol	Species	Common Name	Pot Size	Height	Spread	Spacing
Tr	Backhousia citrifolia	Starfruit Tree	400L	3.5m	3m	AS SHOWN
Er	Ficus microcarpa	Fig	200L	3.5m	3m	AS SHOWN
Gb	Quercus palmarum	Pin Oak	200L	3.5m	2m	AS SHOWN
Gp	Fraxinus aurata	Whitebark	200L	3m	1.5m	AS SHOWN
Tl	Fraxinus aurata	Whitebark	200L	3m	1.5m	AS SHOWN
Wf	Wisteria floribunda	Wisteria	200L	3m	1.5m	AS SHOWN

## EDGE

Symbol	Species	Common Name	Pot Size	Height	Spread	Spacing
Em	Ficus microcarpa var. fulli	Mini weeping Fig	100L	2.5m	1.5-1.5m	1000mm

## SHRUBS / GROUNDCOVERS

Symbol	Species	Common Name	Pot Size	Height	Spread	Spacing
Am	Arctostaphylos uva-ursi	Arctostaphylos	200mm	400mm	400mm	500mm
Al	Arctostaphylos uva-ursi	Arctostaphylos	200mm	400mm	400mm	500mm
Al	Arctostaphylos uva-ursi	Arctostaphylos	200mm	400mm	400mm	500mm
Bm	Banksia integrifolia	Japanese Box	200mm	600mm	400mm	500mm
Cm	Crataegus mollis	Crataegus	200mm	400mm	300mm	600mm
Cs	Crataegus mollis	Crataegus	200mm	400mm	300mm	600mm
Cs	Crataegus mollis	Crataegus	200mm	400mm	300mm	600mm
Dc	Doronicum aegyptium	Black Sea Lily	200mm	400mm	400mm	400mm
Hq	Hydrangea quercifolia	Hydrangea	200mm	400mm	500mm	400mm
Lm	Limonium macranthum	Emerald Green	150mm	300mm	300mm	300mm
Li	Limonium macranthum	Emerald Green	150mm	300mm	300mm	300mm
Ng	Nerium oleander	White Oleander	150mm	600mm	400mm	400mm
Pg	Portulaca grandiflora	Portulaca	150mm	300mm	300mm	300mm
Pg	Portulaca grandiflora	Portulaca	150mm	300mm	300mm	300mm
Pk	Philadelphus coronatus	Star Jasmine	200mm	400mm	500mm	400mm
Tl	Tetragonia tetragonioides	Star Jasmine	200mm	300mm	300mm	300mm
Vh	Viburnum chinensis	Naive Yodhi	200mm	200mm	300mm	300mm

## GROUNDCOVER PLANTING - ROOFTOP



Correa alba



Carpobrotus glaucescens



Myoporum parviflorum



Russelia equisetiformis



Scaevola aemula

## EDIBLE PLANTING - ROOFTOP



Citrus australasica



Tetragonia tetragonioides



Tetragonia tetragonioides

## PLANT SCHEDULE - ROOF

Symbol	Species	Common Name	Pot Size	Height	Spread	Spacing
Tr	Backhousia citrifolia	Starfruit Tree	200L	3m	1.5m	AS SHOWN

## SHRUBS / GROUNDCOVERS

Symbol	Species	Common Name	Pot Size	Height	Spread	Spacing
Ca	Correa alba	White Correa	300mm	500mm	500mm	500mm
Cg	Carpobrotus glaucescens	Pig Face	300mm	300mm	300mm	300mm
Mp	Myoporum parviflorum	Four Cousins	300mm	200mm	300mm	300mm
Ru	Russelia equisetiformis	Four Cousins	300mm	200mm	300mm	300mm
Sc	Scaevola aemula	Pig Face	200mm	200mm	300mm	300mm

## EDIBLE SPECIES

Symbol	Species	Common Name	Size	Height	Spread	Spacing
Ca	Correa alba	White Correa	300mm	500mm	500mm	AS SHOWN
Cg	Carpobrotus glaucescens	Pig Face	150mm	1.2m	600mm	AS SHOWN
Tl	Tetragonia tetragonioides	Winged Greens	150mm	200mm	300mm	300mm

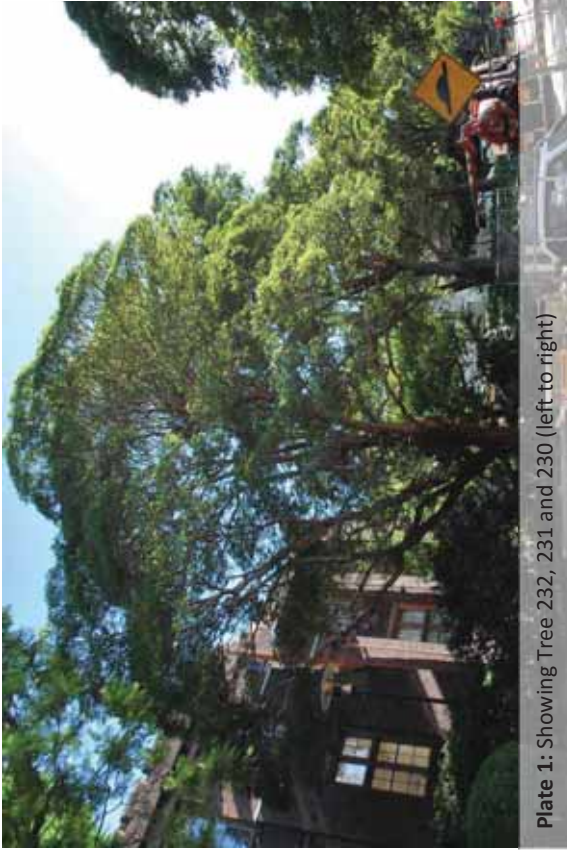
**Appendix 3: Tree Assessment Schedule**

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
229	<i>Lophostemon confertus</i> (Brush Box)	550	11	6	Good	Good	Wound/s, early stages of decay. Partially suppressed.	15-40	Very High	Priority for Retention	6.6	2.6	Retain.
230	<i>Lophostemon confertus</i> (Brush Box)	600	10	6	Fair	Good	Dieback in upper crown. Small (<25mm) diameter deadwood in low volumes. Small (<25mm) epicormic growth in low volumes.	15-40	Very High	Priority for Retention	7.2	2.7	Remove.
231	<i>Lophostemon confertus</i> (Brush Box)	900	25	9	Good	Good	Medium (25-75mm) diameter deadwood & large (>75mm) diameter deadwood in low volumes. Wound/s, early stages of decay.	15-40	Very High	Priority for Retention	10.8	3.2	Retain.
232	<i>Lophostemon confertus</i> (Brush Box)	800	13	7	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Very High	Priority for Retention	9.6	3.1	Retain.
233	<i>Morus nigra</i> (Black Mulberry)	400	6	8	Good	Good	Small (<25mm) diameter deadwood in low volumes. Wound/s, early stages of decay. Phototropic lean, slight. Small (<25mm) epicormic growth in low volumes.	15-40	Low	Consider for Removal	4.8	2.3	N/A
234	<i>Morus nigra</i> (Black Mulberry)	350 200	6	6	Good	Fair	Wound/s, advanced stages of decay. Small (<25mm) epicormic growth in low volumes.	15-40	Low	Consider for Removal	4.9	2.3	N/A
235	<i>Plumeria acutifolia</i> (Frangipani)	200 200 200 200	6	6	Good	Good	Phototropic lean, moderate. Heavily suppressed. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	4.8	2.3	Remove.
236	<i>Jacaranda mimosifolia</i> (Jacaranda)	400 300	13	6	Good	Fair	Co-dominant inclusion. Partially suppressed. Phototropic lean, slight.	15-40	Moderate	Consider for Retention	6	2.5	Remove.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
237	<i>Lophostemon confertus</i> (Brush Box)	300	15	3	Good	Good	Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	3.6	2	N/A
238	<i>Morus nigra</i> (Black Mulberry)	300	5	4	Good	Fair	Small (<25mm) epicormic growth in low volumes. Wound/s, advanced stages of decay.	15-40	Low	Consider for Removal	3.6	2	N/A
240	<i>Syzygium paniculatum</i> (Lillypilly)	200 max	6	3	Good	Good	Group of 37. Double row planting at 2m centres. Inner crown heavily suppressed. Branch inclusion/s, minor. Wound/s, early stages of decay.	15-40	Moderate	Consider for Retention	2.4	1.7	Remove (western end only)
246	<i>Jacaranda mimosifolia</i> (Jacaranda)	500 300	12	9	Good	Good	Partially suppressed. Small (<25mm) epicormic growth in low volumes. Wound/s, early stages of decay.	15-40	High	Priority for Retention	7.1	2.7	Retain.
247	<i>Acmena smithii</i> (Lillypilly)	150	6	3	Good	Good	Partially suppressed. Wound/s, early stages of decay.	15-40	Low	Consider for Removal	2	1.5	N/A
248	<i>Lophostemon confertus</i> (Brush Box)	750 400 400	13	7	Good	Good	Partially suppressed.	15-40	Very High	Priority for Retention	11.3	3.3	Retain.
249	<i>Lophostemon confertus</i> (Brush Box)	500 500 150	12	8	Fair	Good	Small (<25mm) diameter deadwood in moderate volumes. Medium (25-75mm) diameter deadwood in low volumes. Crown density 75-100%.	15-40	Very High	Priority for Retention	8.8	2.9	Retain.
250	<i>Acer palmatum</i> (Japanese Maple)	150 150 150	7	4	Good	Good	Partially suppressed. Wound/s, early stages of decay.	15-40	Low	Consider for Removal	3.1	1.9	N/A
251	<i>Liquidambar formosa</i> (Oriental Liquidambar)	300	10	5	Good	Fair	Phototropic lean, moderate. Occluded trunk wound. Partially suppressed.	15-40	Moderate	Consider for Retention	3.6	2	Remove.

Tree No.	Species	DBH (mm)	Height (m)	Radial Crown Spread (m)	Health Rating	Structural Rating	Comments	ULE (years)	L/Significance	Retention Value	Radial TPZ (m)	Radial SRZ (m)	Implication
775	<i>Corymbia eximia</i> (Yellow Bloodwood)	200	8	3	Good	Good	Phototropic lean, moderate. Partially suppressed. Small (<25mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	N/A
776	<i>Banksia integrifolia</i> (Coastal Banksia)	250	9	4	Good	Good	Phototropic lean, moderate. Partially suppressed. Wound/s, early stages of decay.	15-40	Low	Consider for Removal	3	1.9	N/A
777	<i>Grevillea</i> sp. (Grevillea)	100	5	2	Fair	Fair	Dieback in upper crown. Medium (25-75mm) diameter deadwood in moderate volumes. Phototropic lean, slight. Partially suppressed.	5-15	Low	Consider for Removal	2	1.5	N/A
1154	<i>Corymbia eximia</i> (Yellow Bloodwood)	200	5	4	Good	Good	Phototropic lean, moderate. Partially suppressed. Medium (25-75mm) diameter deadwood in low volumes.	15-40	Low	Consider for Removal	2.4	1.7	N/A
1176	<i>Ficus rubiginosa</i> (Port Jackson Fig)	250 200 200 200 150 150 100 100	6	5	Good	Fair	Codominant inclusion. Partially suppressed. Crossing branches.	15-40	Moderate	Consider for Retention	6	2.5	N/A
1177	<i>Ficus rubiginosa</i> (Port Jackson Fig)	250 250 250	6	6	Good	Fair	Codominant inclusion. Partially suppressed.	15-40	Moderate	Consider for Retention	5.3	2.4	N/A
1178	<i>Jacaranda mimosifolia</i> (Jacaranda)	300 est	5	3	Good	Fair	Codominant inclusion. Branch inclusion/s, minor. No access to tree base.	15-40	Low	Consider for Removal	3.6	2.0	N/A
1235	<i>Syzygium paniculatum</i> (Lillypilly)	300 250 200	6	4	Good	Good	Wound/s, early stages of decay. Crown contact with adjacent building and fence.	15-40	Moderate	Consider for Retention	5.6	2.5	Remove.

**Appendix 4: Plates**



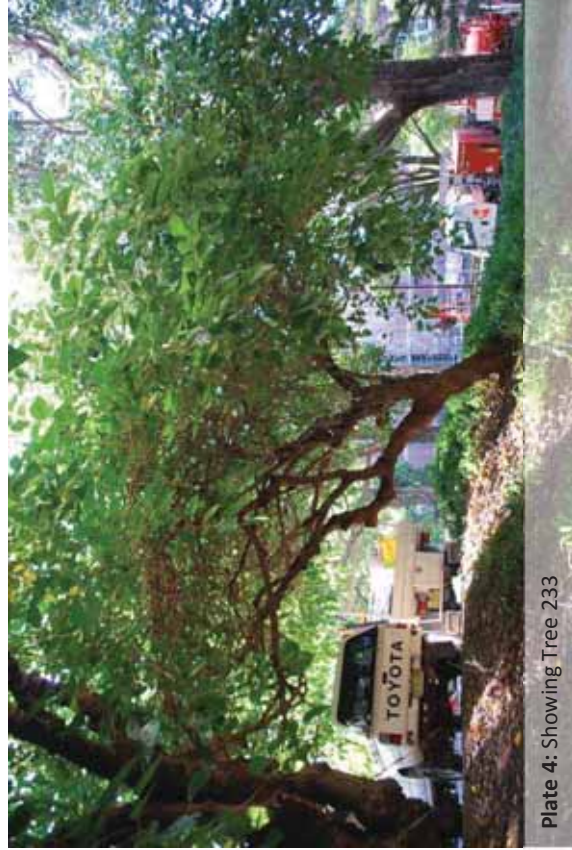
**Plate 1:** Showing Tree 232, 231 and 230 (left to right)



**Plate 2:** Showing Tree 246



**Plate 3:** Showing Tree 248



**Plate 4:** Showing Tree 233



**Plate 5:** Showing Trees 238, 237 and 236 (left to right)



Plate 6: Showing co-dominant inclusion Tree 236



Plate 7: Showing Group 240



Plate 8: Showing Trees 775 and 1154



Plate 9: Showing Trees 776



Plate 10: Showing Tree 1177

## Appendix 6: 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 located at 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 5**).

### 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.

## 1.6 Ground Protection

To protect the underlying soil from compaction, machinery movements 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 appended **Tree Protection Plan** and Typical Tree Protection Details (3) (**Appendix 5**).

## 1.7 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 (>25mm $\emptyset$ ) 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 (>25mm $\emptyset$ ) where deemed necessary by the Project Arborist.

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

Where deemed necessary by the Project Arborist, structures shall be shattered with a hand-operated pneumatic/electric breaker to minimise disturbance to the tree's roots, and demolition waste removed by hand.

The existing pavement shall be carefully lifted to minimise damage to the underlying soil profile (or sub-base materials) and to prevent damage to tree roots. Wherever possible, existing sub-base materials shall remain in-situ.

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.

If roots (>25mm $\emptyset$ ) 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.

## 1.9 Access/Walls/Stairs Installation

Hand excavation and root pruning shall be undertaken by the Project Arborist along the line of the access/walls/stairs within TPZ areas prior to machine excavation. Where significant roots are present (as determined by the Project Arborist) wall footings shall be modified to bridge roots. No over excavation for wall installation shall be permitted. Drainage to the rear of retaining walls shall utilise slim line products (e.g. Atlantis Draincell).

## 1.10 Grading/Pavement Installation

Grading between the existing steps on the footpath fronting the R.D Watt Building and the new access way to the east of the R. D Watt Building. shall be undertaken in small increments using a compact excavator fitted with a flat bladed bucket under the supervision of the Project Arborist. Where required, pavement sub-base layers shall be either, thinned or finished pavement levels amended to enable the retention of significant roots (as determined by the Project Arborist).

## 1.11 Underground Services

Underground service installation within the TPZ shall be supervised by the Project Arborist.

The installation of underground services shall be located outside of the TPZ. Where this is not possible, they shall be installed using either hydrovac or hand excavation methods with the services installed around/below roots (>25mm $\emptyset$ , or as determined by the Project Arborist).

Alternatively, boring methods may be used for underground service installation where the installation depth is greater than 800mm below existing grade. Excavations for starting and receiving pits for boring equipment shall be located outside of the TPZ or located to avoid roots (>25mm $\phi$ , or as determined by the Project Arborist).

#### **1.12 Plant Installation**

Plant installation within TPZ areas shall be undertaken using hand tools and roots (>25mm $\phi$ ) 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.

#### **1.13 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 shall be undertaken in small increments, guided by a spotter who is to look for and prevent damage to roots (>25mm $\phi$ ).

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.

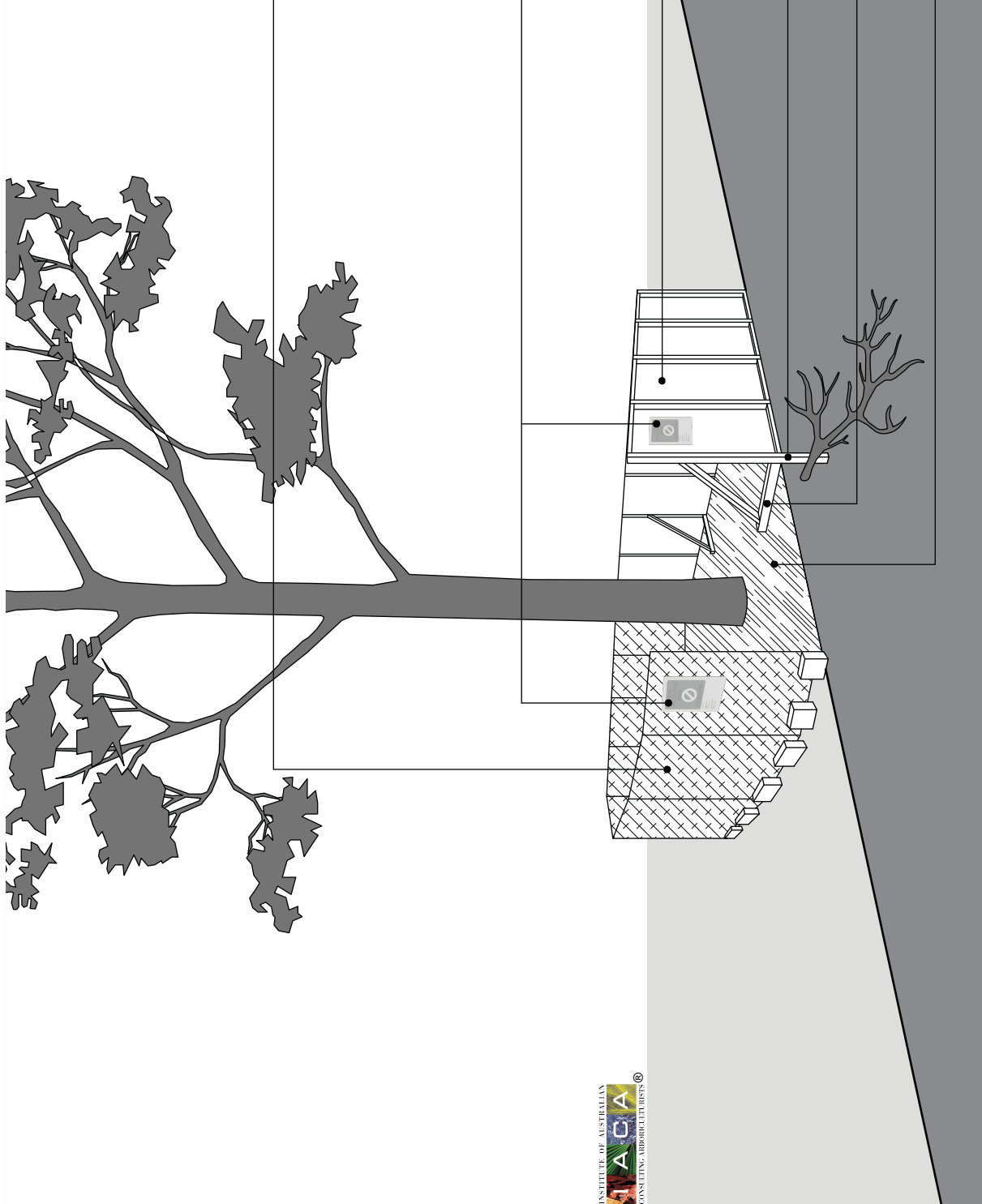
No over-excavation, battering or benching shall be undertaken beyond the footprint of any structure unless approved by the Project Arborist. Hand excavation and root pruning shall be undertaken along the excavation line prior to the commencement of mechanical excavation to prevent tearing and shattering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

Roots (>25mm $\phi$ ) shall be pruned by the Project Arborist only. Roots (<25mm $\phi$ ) 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.

## Appendix 7: 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.

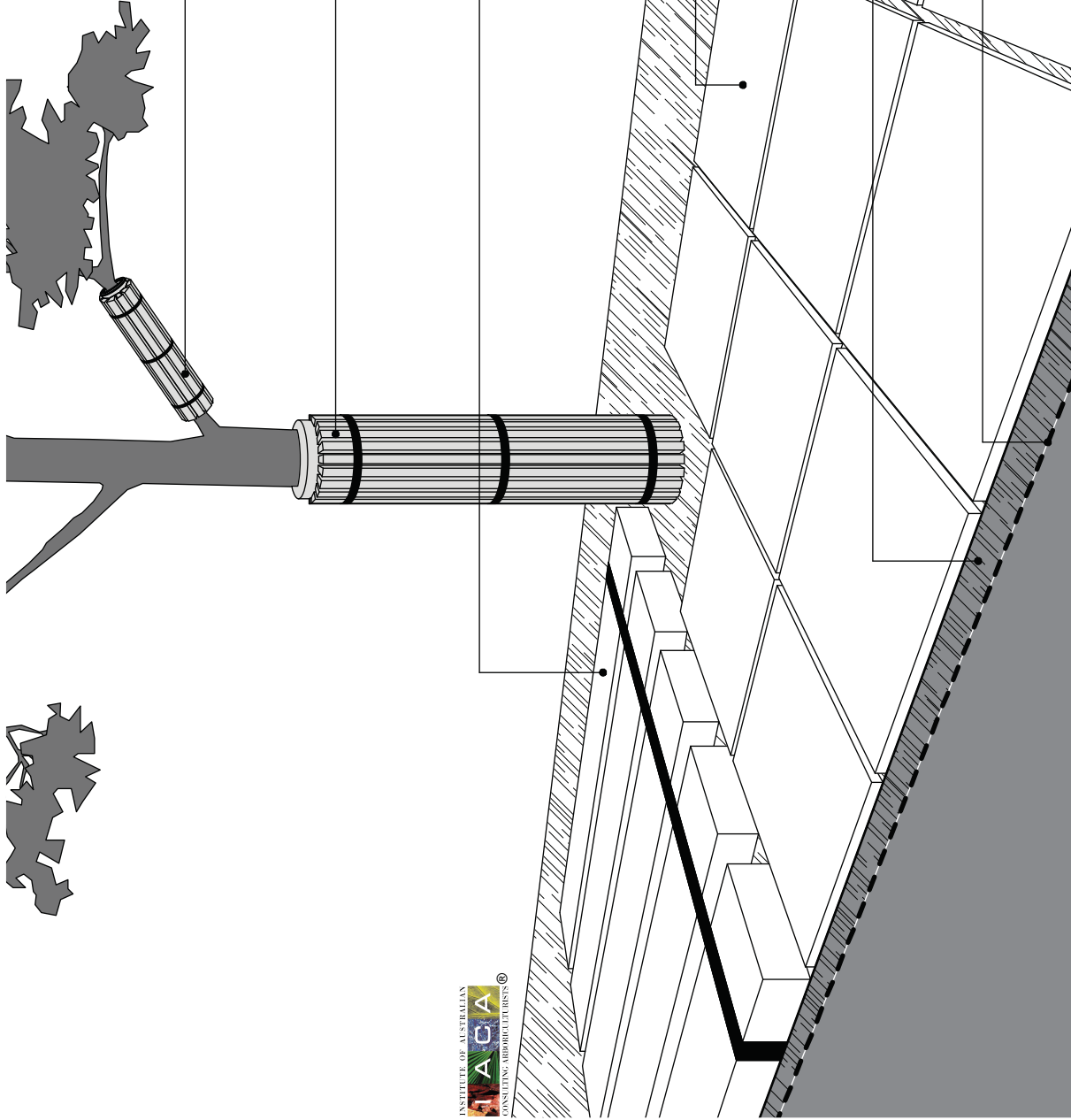
Tree Protection Zone (TPZ) sign

**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.