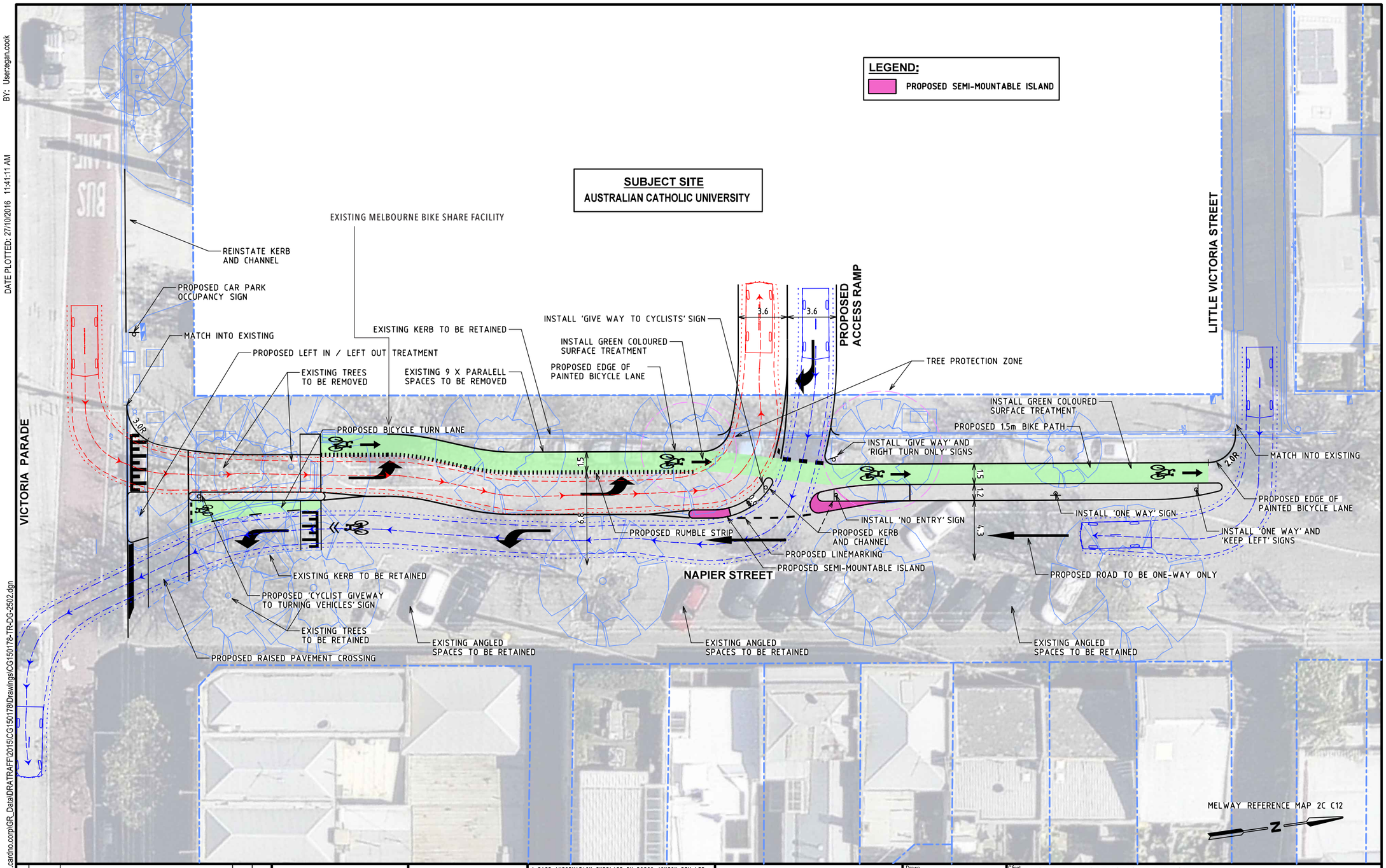

DATE PLOTTED: 27/10/2016 11:41:11 AM BY: User:egan.cook

CAD File: \\AUMEL.CFS01.cardno.corp\GR_Data\DRATRAFF\2015\CG150178\Drawings\CG150178-TR-DG-2502.dgn

Rev	Date	Description	Drawn	Appr.
4	05.10.2016	COUNCIL COMMENTS	CS	SM
3	11.10.2016	COUNCIL COMMENTS	TR	SM
2	07.10.2016	CLIENT COMMENTS	EG	SM
1	27.09.2016	ISSUED FOR INFORMATION	CS	JPM

0 2.5 5.0
1:250 @ A3

WARNING
BEWARE OF UNDERGROUND SERVICES
THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.

1. BASE INFORMATION SUPPLIED BY BOSCO JONSON PTY LTD, REF No. 29460 AND NEARMAP AERIAL PHOTOGRAPHY. (BASE INFORMATION IS PARTIALLY INDICATIVE, SUBJECT TO FULL FEATURE SURVEY)
2. ALL DIMENSIONS TO FACE OF KERB AND CHANNEL U.N.O
3. DECLARED ROAD - VICTORIA PARADE (SPEED ZONE 60KM/H) LOCAL ROAD - NAPIER STREET (SPEED ZONE 50KM/H)
4. LINE MARK IN ACCORDANCE WITH VICROADS TEM VOLUME 2 AND REMOVE ALL REDUNDANT LINEMARKING.

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Shaping the Future
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501 Swanston Street, Melbourne, VIC Australia 3000
Phone (+61 3) 8415 7777 Fax (+61 3) 8415 7788
Email: victoria@cardno.com.au Web: www.cardno.com.au/victoria

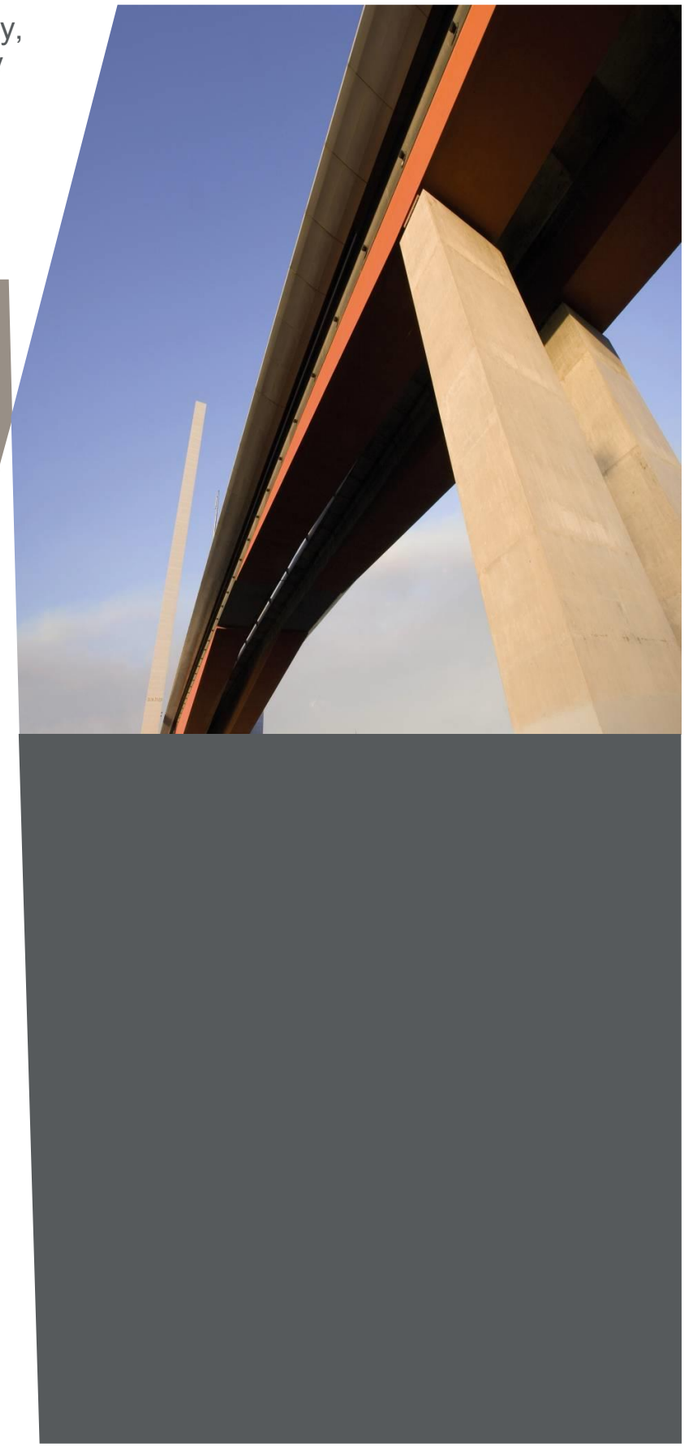
Drawn	C.SANSTOUPET
Designed	C.SANSTOUPET
Checked	JP.MAINA
Authorised	JP.MAINA

Client	AUSTRALIAN CATHOLIC UNIVERSITY
Project	AUSTRALIAN CATHOLIC UNIVERSITY NAPIER STREET, FITZROY CITY OF YARRA
Title	SIGNAGE AND LINEMARKING PLAN FUNCTIONAL LAYOUT PLAN OPTION 02
Status	PRELIMINARY NOT TO BE USED FOR CONSTRUCTION PURPOSES
Date	11.10.2016
Scale	1:250
Size	A3
Drawing Number	CG150178-TR-DG-2502
Revision	4

Australian Catholic University,
St. Patricks Campus, Fitzroy

APPENDIX B

BICYCLE PARKING PRODUCTS



Cardno
Shaping the Future

BICYCLE NETWORK

Anaconda™

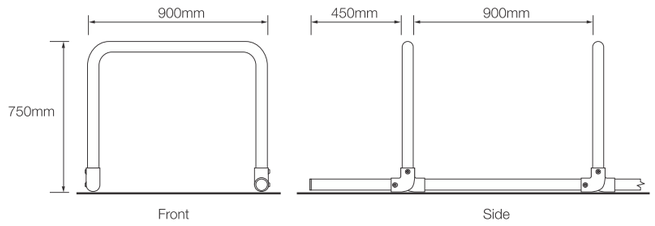
Galvanised finish

Features

Anaconda rails are a freestanding version of the Flat Top. These are an excellent solution for use on asphalt or for temporary event parking. Available in a variety of materials and finishes in both adult and junior sizes.

- Easy to use with any bike lock
- Freestanding, self-supporting and can be fastened to all surfaces
- Using clamp-on elbows to join the rails
- Powder coated, galvanised, alloy or stainless steel rail tubing available
- Parks two bicycles per rail in either parallel or diagonal set up
- Supports all styles of bicycles in an upright position

Dimensions



Specifications

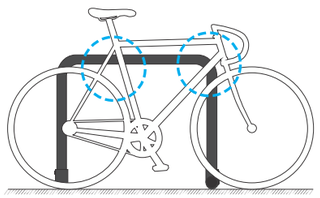
Material options
- 316 Marine grade stainless steel
- Galvanised
- Powder coated
- Alloy

Fixing options
- Clamp on

Recommended fasteners
- Zinc plated Dynabolts (M10 x 65mm)
- Stainless Dynabolts (M10 x 65mm)

Dimensions
900mm [w] x 750mm [h]

Locking points



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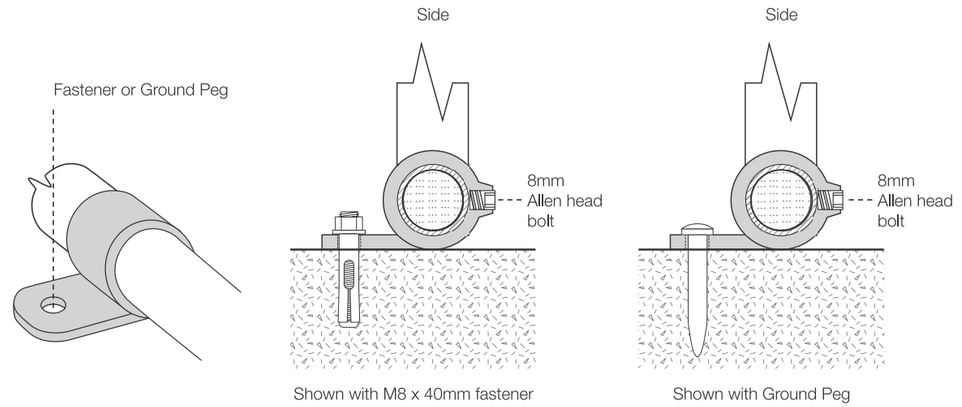
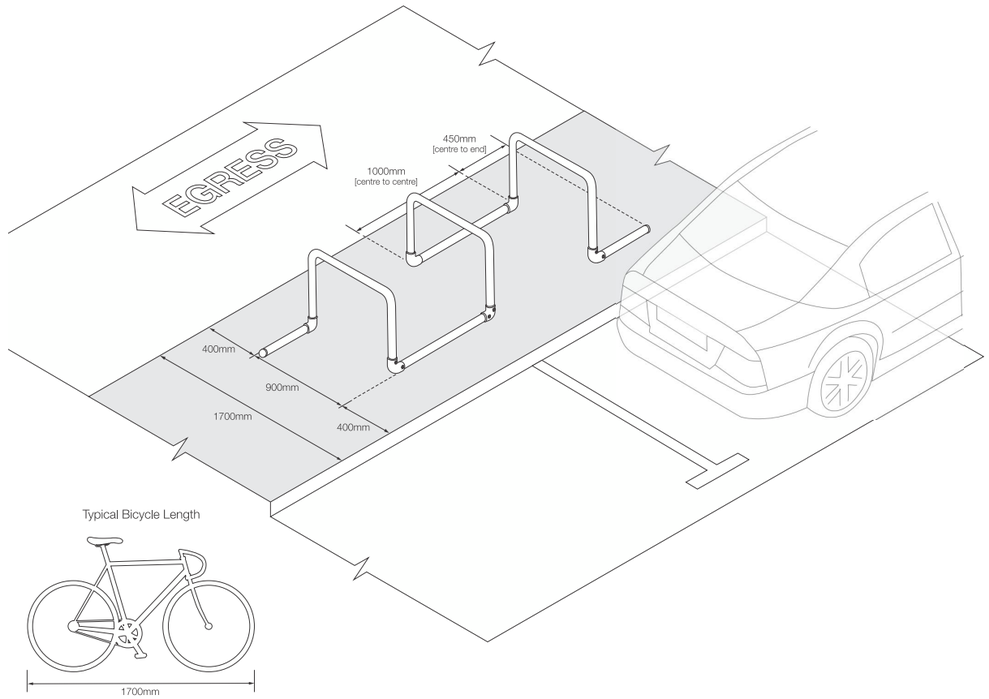
BIKE PARKING EXPERTS®

Fixing options

Fix to the ground with Ground Tabs fitted over the piping at each end and secured with 8mm Allen bolts. Use either a Fastener or Ground Peg to secure the Anaconda to the ground.



Layout guidelines



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BIKE PARKING EXPERTS®

BICYCLE NETWORK

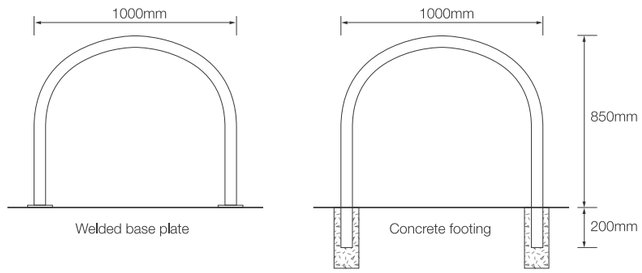
Arc de Triomphe™

Stainless steel finish

Features

- Each rail supports two adult bikes in an upright position
- Can be either bolted to a concrete slab or concreted in situ
- Available in stainless steel or galvanised steel
- Provides the ability to lock both wheels and frame
- Suitable for foyers and entry areas

Dimensions



Specifications

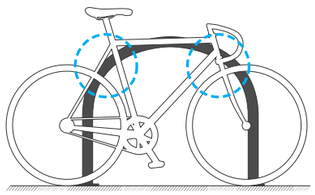
Material options
- 316 Marine grade stainless steel
- Galvanised

Fixing options
- Welded flange
- In situ

Recommended fasteners
- Galvanised Dynabolts (M10 x 65mm)
- Stainless Dynabolts (M10 x 65mm)
- Shear Nut security fasteners

Dimensions
1000mm [w] x 850mm [h]

Locking points



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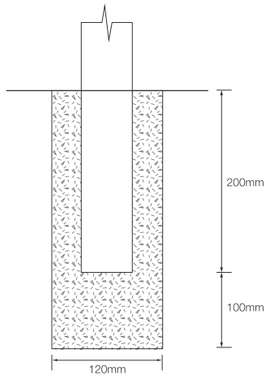
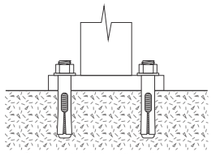
BIKE PARKING EXPERTS®

Fixing options

In situ (Concrete footing)

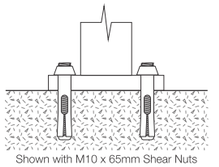


Welded flange (Bolt on)



Shown with M10 x 65mm fastener

Welded flange (Security heads)

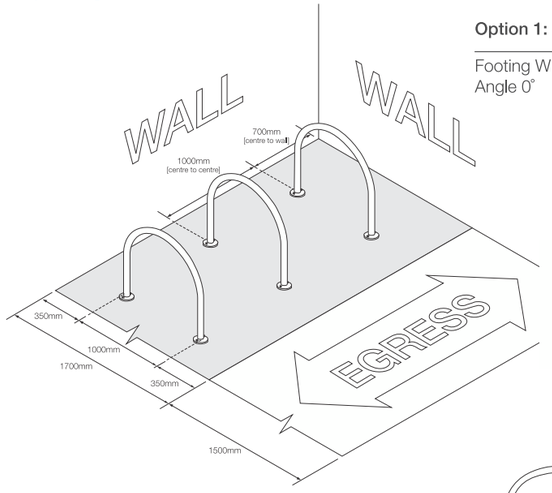


Shown with M10 x 65mm Shear Nuts

Layout guidelines

Option 1:

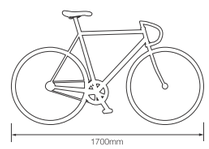
Footing Width 1700mm
Angle 0°



Option 2:

Footing Width 1200mm
Angle 45°

Typical Bicycle Length



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BIKE PARKING EXPERTS®

BICYCLE NETWORK

Flat Top™

Stainless steel finish

Features

- Each rail supports two adult bikes in an upright position
- Can be either bolted to a concrete slab or concreted in situ
- Available in stainless steel or galvanised steel
- Provides the ability to lock both wheels and frame
- Suitable for interior use including storage cages

Specifications

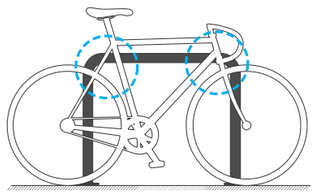
Material options
- 316 Marine grade stainless steel
- Galvanised

Fixing options
- Welded flange
- In situ

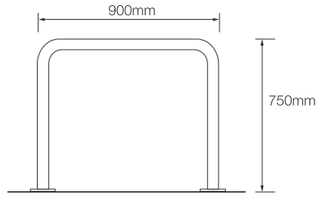
Recommended fasteners
- Galvanised Dynabolts (M10 x 65mm)
- Stainless Dynabolts (M10 x 65mm)
- Shear Nut security fasteners

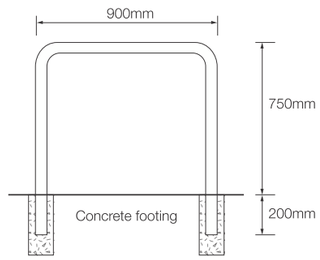
Dimensions
950mm [w] x 750mm [h]

Locking points



Dimensions





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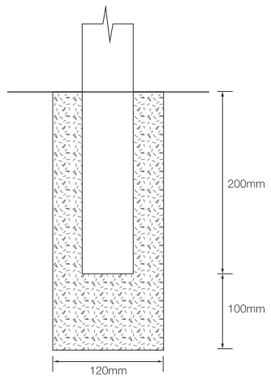
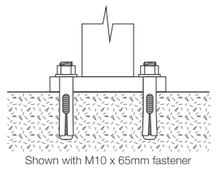
BIKE PARKING EXPERTS®

Fixing options

In situ (Concrete footing)

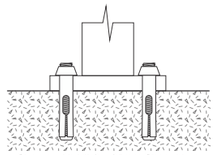


Welded flange (Bolt on)



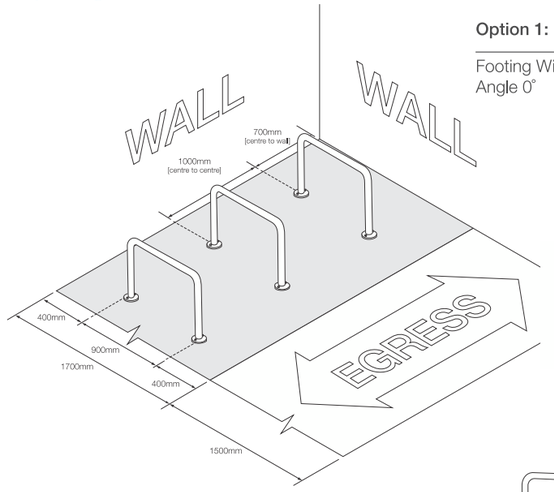
Shown with M10 x 65mm fastener

Welded flange (Security heads)



Shown with M10 x 65mm Shear Nuts

Layout guidelines

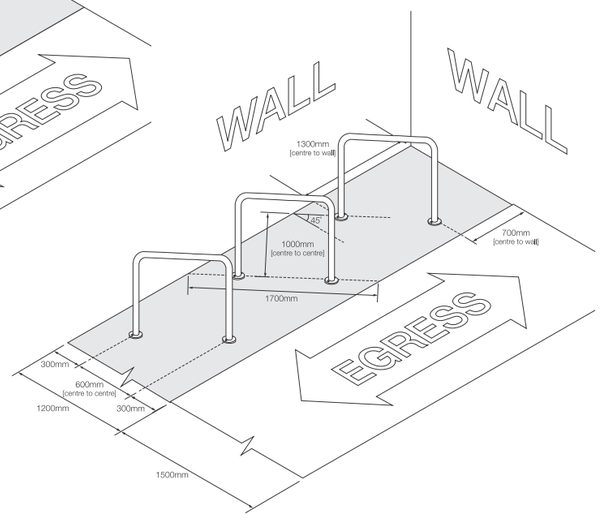


Option 1:

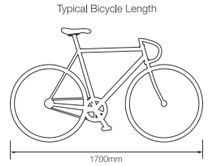
Footing Width 1700mm
Angle 0°

Option 2:

Footing Width 1200mm
Angle 45°



Typical Bicycle Length



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BIKE PARKING EXPERTS®

BICYCLE NETWORK

Ned Kelly®™

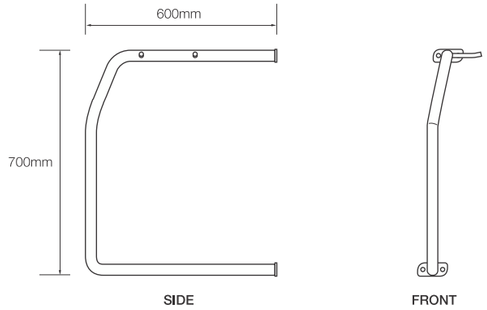
Galvanised finish

Black powder coat finish

Features

- Each rail provides storage for a single bike
- Suits bikes with full length mud guards
- Available in galvanised or powder coat over mild steel
- Provides the ability to lock the main frame and one wheel
- Support prongs with protective coating prevent damage to rim
- Can be used with custom framing – no wall needed

Dimensions



Specifications

Material options
- Galvanised
- Powder coat over mild steel
- Stainless steel*

Fixing options
- Bolt on to wall
- Fixed to support framing

Recommended fasteners – wall
- Dynabolts (M8 x 40mm)
- Shear Nut security fasteners

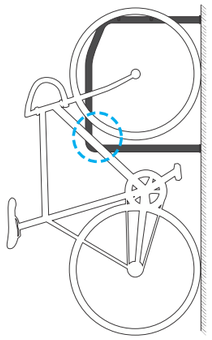
Recommended fasteners – framing
- Bolt and nut (M10 x 60mm)
- Tek screws

Dimensions

125mm [w] x 700mm [h] x 600mm [d]

** Pre-order only*

Locking points



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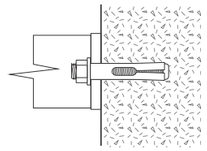
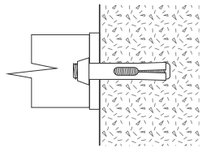
Fixing options

Fix to a wall using 4x fasteners or Shear Nuts

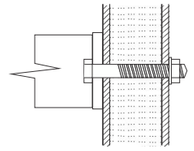


Shown with M8 x 40mm fastener

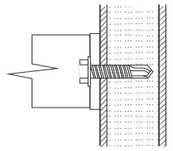


Shown with M8 x 40mm Shear Nuts

Fix to a frame using 4x bolts or Tek Screws



Shown with M10 x 60mm Bolt, Washer & Nut

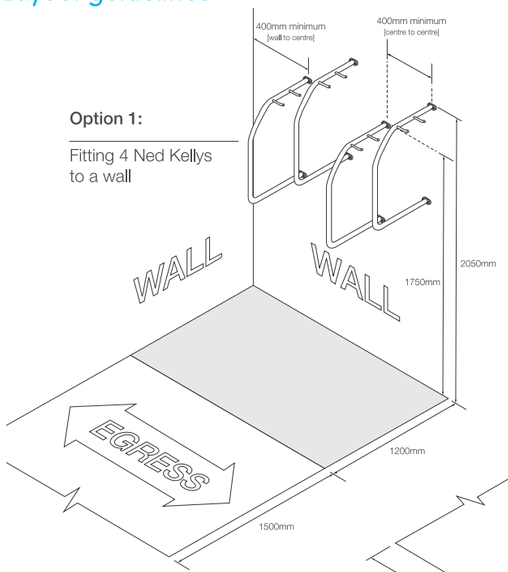


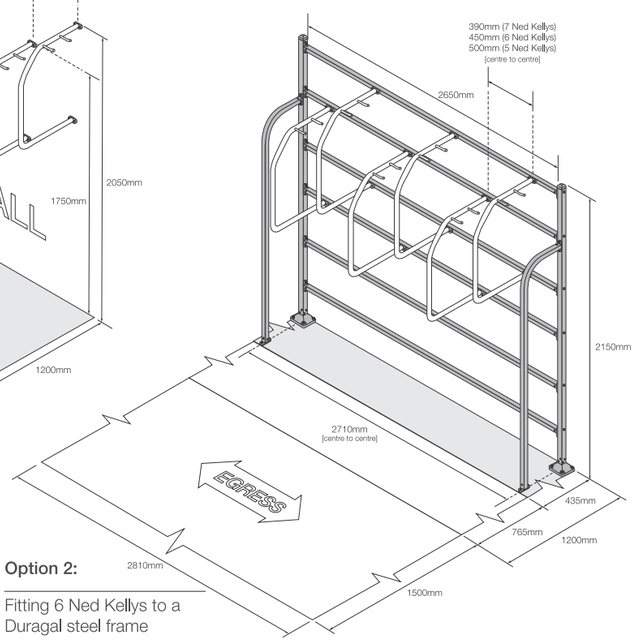
Shown with Tek Screw

Layout guidelines

Option 1:

Fitting 4 Ned Kellys to a wall





Option 2:

Fitting 6 Ned Kellys to a Duragal steel frame

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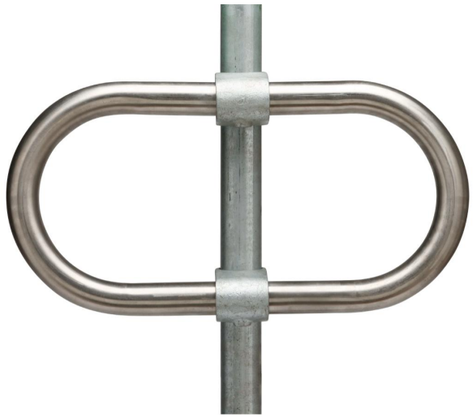
BIKE PARKING EXPERTS®

BICYCLE NETWORK

Pole Vault™



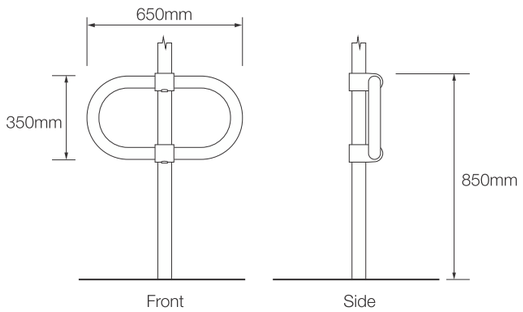
Stainless finish

Features

The Pole Vault is an innovative street sign mounted bike parking rail that can be fitted in minutes with no drilling or concrete required.

- Can be retro-fitted to existing sign poles
- Accommodates a wide range of sizes and styles of bikes
- Can be moved and re-fitted to different locations
- Comes in standard galvanised, powdercoat or stainless material
- Easy to use with any bike lock
- Supports the entire bike so it won't slip or fall over

Dimensions



Specifications

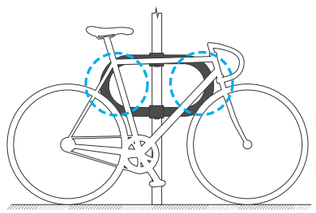
Material options
- 316 Marine grade stainless steel
- Galvanised

Fixing options
- Clamp on

Recommended fasteners
- 8mm Allen head bolts

Dimensions
650mm [w] x 350mm [h]

Locking points



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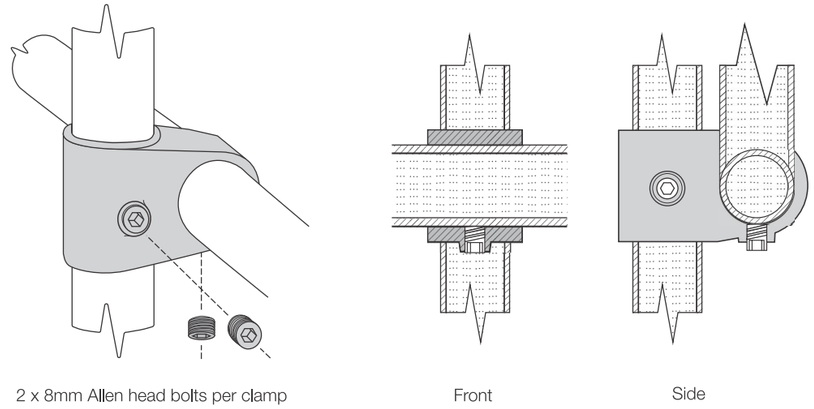
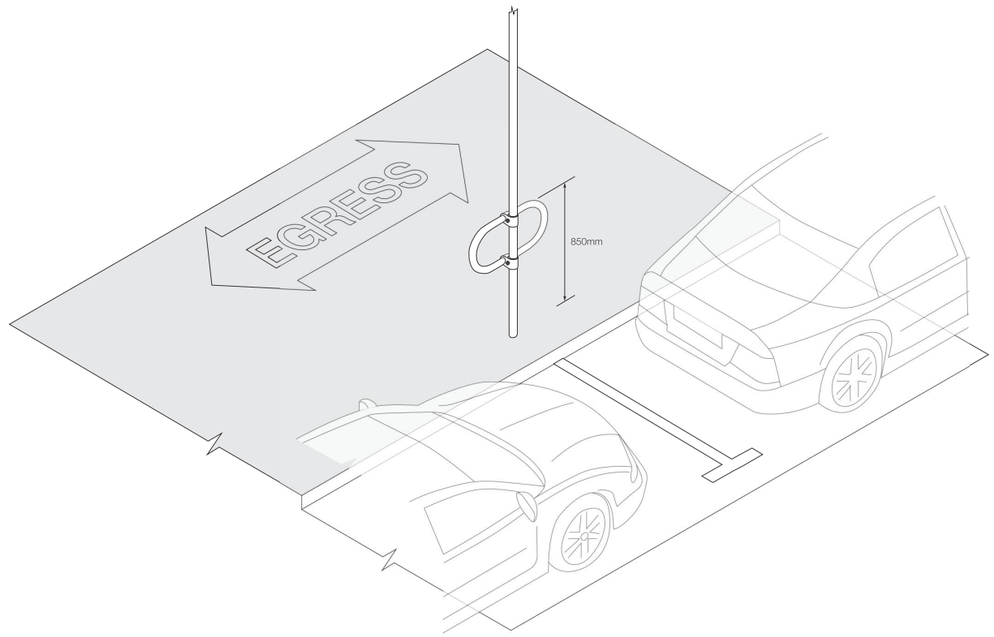
BIKE PARKING EXPERTS®

Fixing options



Layout guidelines



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BIKE PARKING EXPERTS®

BICYCLE NETWORK

Towel Hitching™

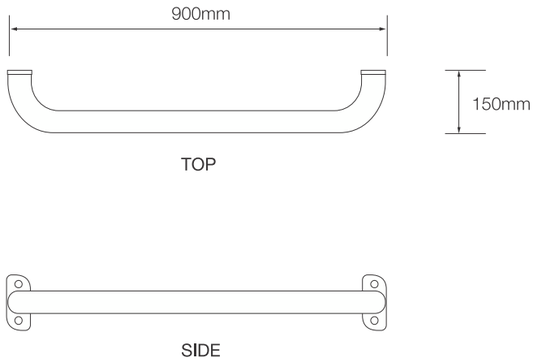
Zinc treated finish

Features

The Towel Rail is a space-efficient solution for parking single bikes against a wall, useful in narrow corridors.

- Space-efficient, can be fitted to narrow corridors
- Can be supplied in powdercoat or galvanised finish
- Accommodates all types and sizes of bicycle
- Is easy to use with any bike lock
- Requires no lifting

Dimensions



Specifications

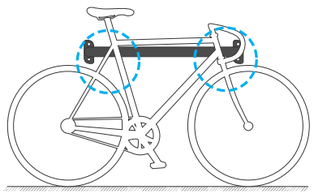
Material options
- Powder coated
- Stainless steel
- Zinc treated
- Galvanised

Fixing options
- Welded flange - Bolt On

Recommended fasteners
- Zinc plated dynabolts (M8 x 40mm)

Dimensions
900mm [w] x 150mm [d]

Locking points



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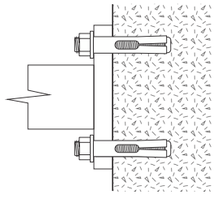
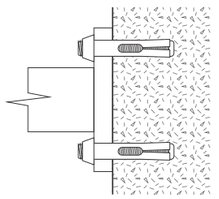
Fixing options

Fix to a wall using 4x fasteners or Shear Nuts

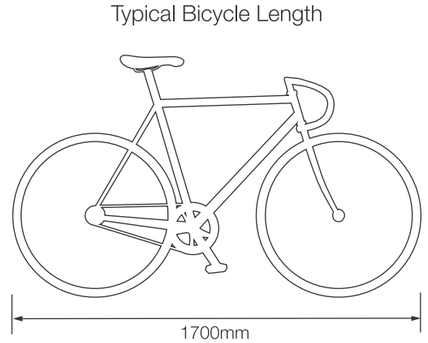


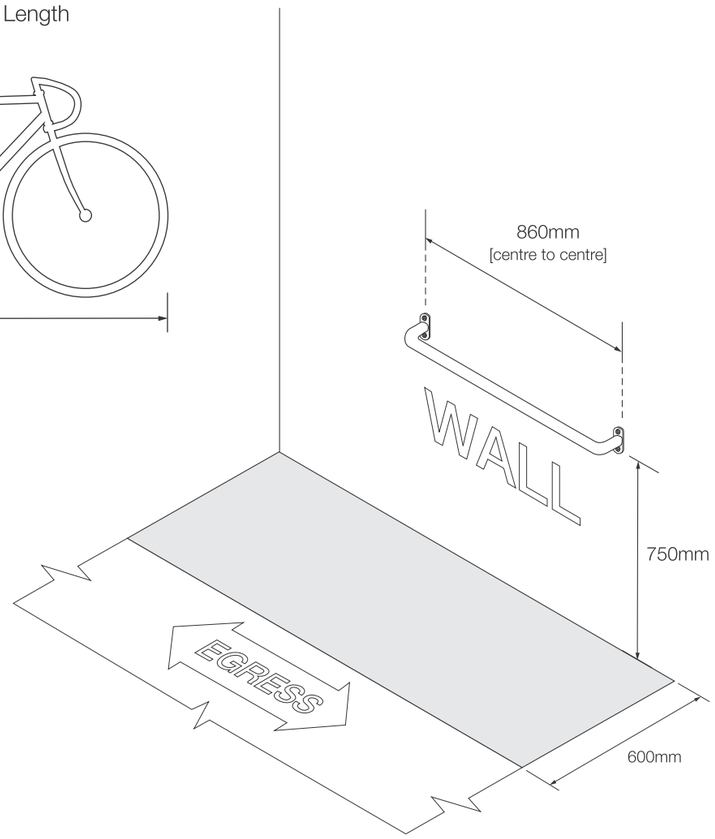
Shown with M8 x 40mm fastener



Shown with M8 x 40mm Shear Nuts

Layout guidelines





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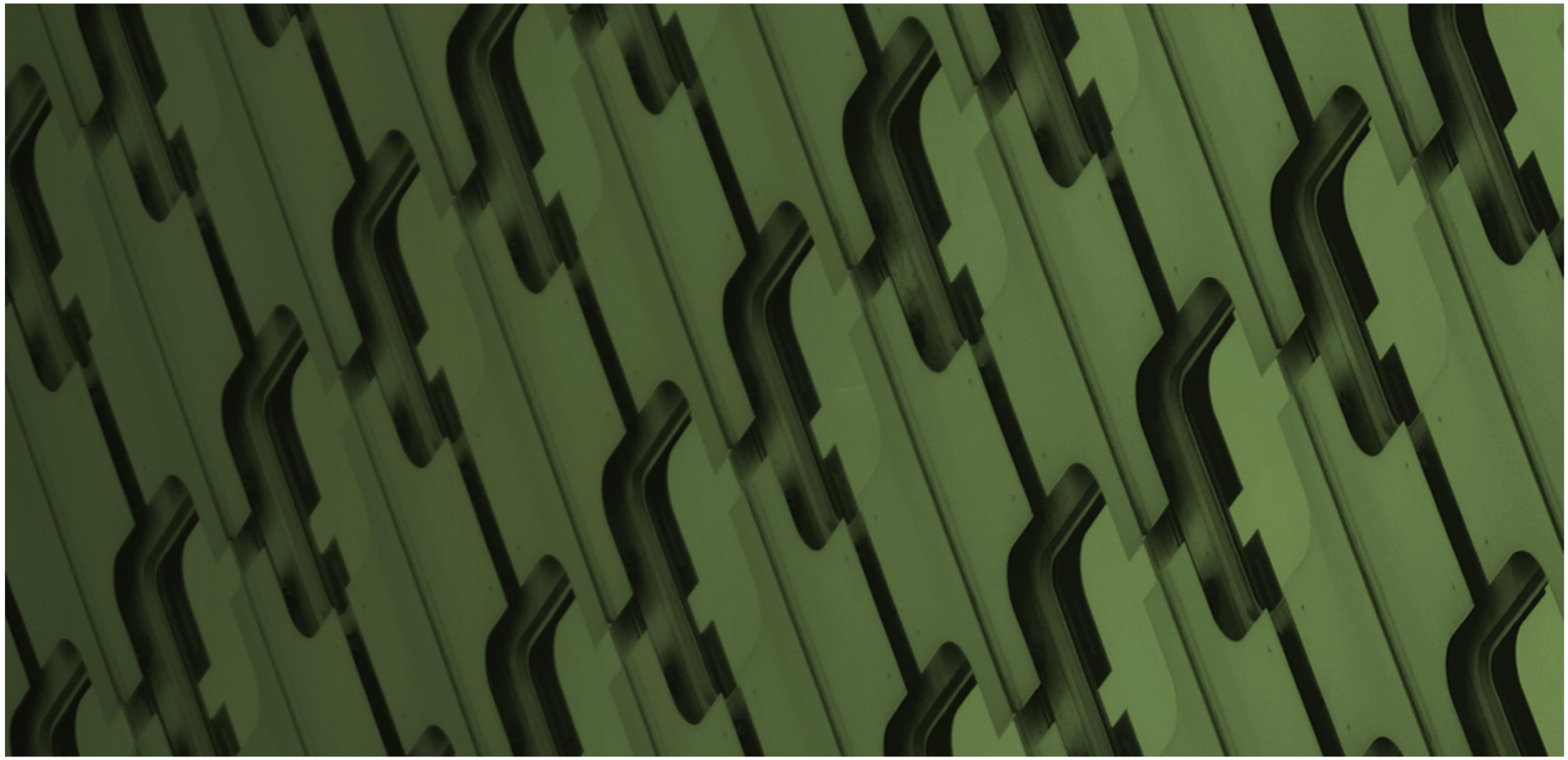
Wind Microclimate Assessment

Mother Teresa Building - External comfort Study



Wind Microclimate Assessment

Mother Teresa Building - External comfort Study

Client: Australian Catholic University

ABN: 15050192660

Prepared by

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Date	30-Nov-2017
Prepared by	Nicki Parker/ Sian Willmott
Reviewed by	David Jarratt

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	19-Oct-2016	Issued for inclusion to Development Plan	Russell Evans Technical Director	
1	30-Nov-2017	Updated to include outdoor activity court	Russell Evans Technical Director	

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Executive Summary

This report assesses the likelihood that wind-induced discomfort may be felt by patrons of various outdoor spaces around the proposed Mother Teresa building for the Australian Catholic University. The assessment draws on a large local meteorological data set adjusted for location and height.

Winds are assessed against the Lawson comfort criteria, which sets upper wind speeds for comfort during a range of typical activities — long-term sedentary (e.g. sitting at café tables), short-term sedentary (e.g. queuing, talking), slow movement (e.g. window shopping, strolling), and rapid movement (e.g. fast walking).

Based on hourly wind speed and direction data collected from the Melbourne Regional Office (located approximately 1km to the west of the site), predominant winds are west south westerly and north easterly throughout the year and during business hours, as well as outside of business hours. These two key wind directions have therefore been the focus of the analysis provided for this submission.

Seven locations within and around the site have been identified as being sensitive to wind speed. These are summarised in the table below, along with the desired wind comfort and activity category. Potential issues have been highlighted.

Table 1: Wind assessment summary and impacts

Location		Desired wind comfort and activity category	Potential wind microclimate impacts
1	Ground level outdoor seating around within the site boundary	Comfortable for pedestrians sitting or standing for longer periods of time	Channelling of winds along Victoria Parade – some local mitigation may be required.
2	Along Napier Street	Comfortable for pedestrians leisure walking	Unlikely to be significant impacts caused by the proposed building.
3	Along Victoria Parade	Comfortable for pedestrians leisure walking	Unlikely to be significant impacts caused by the proposed building.
4	Level 4 Terrace	Comfortable for pedestrians sitting or standing for shorter periods of time	Exposed to predominant winds – balustrades likely to provide sufficient protection.
5	Level 6 Terrace	Comfortable for pedestrians sitting or standing for shorter periods of time	Exposed to predominant winds – balustrades likely to provide some protection. Additional local mitigation may be required.
6	Along Young Street	Comfortable for pedestrians leisure walking	Unlikely to be significant impacts caused by the proposed building.
7	Along Little Victoria Street	Comfortable for pedestrians leisure walking	Unlikely to be significant impacts caused by the proposed building.
8	Outdoor Activity Court	Comfortable for pedestrians sitting or standing for shorter periods of time	Unlikely to be significant impacts caused by the proposed building.

Due to the relatively low wind speeds experienced in this area of Melbourne, there are unlikely to be any significant adverse impacts at Ground Level within or surrounding the site due to the construction of the proposed development. The staggered, non-uniform shape of the building envelope is likely to minimise wind acceleration, with horizontal shading further assisting in minimising potential issues.

A detailed computational analysis will be undertaken during the next design stage which will quantify expected wind speeds and compare these against the Lawson comfort criteria.

30-Nov-2017
Prepared for – Australian Catholic University – ABN: 15050192660

1.0 Introduction

It is somewhat inevitable that, with the construction of a new development, the wind microclimate in the vicinity will be changed. Where new buildings are significantly different in size and form, orientation or height from those in the immediate vicinity, winds can be introduced which may cause discomfort to pedestrians. The design of a development should therefore consider the provision of a quality outdoor environment, which is appropriate for its designated use for the majority of the year. Due to the height and layout of the proposed building a number of potentially adverse wind effects may be experienced.

This study is an experience based qualitative review of the pedestrian level wind environment around the proposed Mother Teresa building. The assessment of wind conditions is based upon our experience with other similar schemes and our knowledge of the interaction of the wind with the built environment. The wind conditions around the proposed development in relation to planned pedestrian activities have been considered and an assessment of the potential impact that the proposed development may have on the surrounding area's wind microclimate is provided. Areas where wind is likely to be accelerated by geometrical features are highlighted and ways to mitigate these effects are recommended.

Local authority planning guidelines typically focus on user comfort and safety. Here, users are usually taken to be at ground level (or the main podium level etc.) of a particular space. They may be passing through on foot or bicycle; wandering slowly (e.g. talking); sitting or standing for a short period (e.g. at a bus stop) or for a long period (e.g. outdoor dining). Planning criteria focus on the frequency of high winds, which are known to be uncomfortable in various situations and for various durations of exposure.

Upper-level users of balconies etc. may also be affected by winds, but exposure is generally considered to be by choice and easily avoidable. In rare cases, outdoor dining or other regular outdoor activity may take place relatively high above ground level, in which case special assessments must be made.

As this is a desk based study, quantification of likely increases or decreases in wind speed cannot be given and only an indication of likely conditions that pedestrians will experience is presented here.

1.1 Purpose, basis and limitations of this report

The purpose of this report is to provide evidence as to the likelihood of wind-induced discomfort to ground-level users of the spaces around the building.

This report presents probabilistic estimates of the likelihood of events which may have comfort implications. These are based on historical wind data and measured against commonly available wind effects criteria using accepted estimated methods. Given these limitations, AECOM cannot guarantee with certainty that the development will not adversely impact upon safety and comfort in the public realm.

This report is based on drawings and other information supplied; a statistical analysis of data; published methodologies for wind assessment; and experience with assessing wind flows around buildings. The statistical analysis does not include an allowance for rare high-wind events such as severe storms. Also note that future wind patterns may not reflect past wind patterns. For example, changes in wind climate due to global warming are not accounted for. This report does not address structural aspects of wind phenomena.

All advice is provided with best intent and to the accuracy limits of the nature of the assessment undertaken.

2.0 Assessment criteria

2.1 Basis

Wind speed and gustiness are the primary measurable factors affecting people's comfort. Other factors such as air temperature and humidity, clothing, sun exposure, etc. are also significant, but these can often be addressed by a modification of effective wind speeds (Twidell, 2006).

Wind speed is understood to mean the average wind speed taken over a time of one hour or so. Gustiness refers to the rate of change of wind speed, usually identified with the turbulent intensity defined by ratio of the standard deviation of the mean wind speed to the mean itself. The important wind gusts are those lasting 2–3 seconds, being the time taken to perform a simple act such as a few walking steps, opening a door etc.

Gustiness is a difficult factor to assess on the urban micro-scale. Fortunately, the implied turbulent intensity may be related to the underlying means in order to recast gustiness criteria in terms of mean wind speed (Twidell, 2006), (Melbourne, 1978), (ASHRAE, 2001), (Blocken, 2004). Estimates of turbulent intensity in urban situations range from 15% to 30% (Twidell, 2006), implying that gust wind speeds are generally 1.5–2.0 times greater than mean wind speeds.

2.2 Comfort

In general, comfort criteria relate to both the thermal effects of wind on people, and the mechanical effects of wind on their activities.

The comfort criteria used in this study is the Lawson criteria (Lawson, 1978), based on the probability of exceeding certain mean wind speeds. The criteria are presented in Table 2. Wind conditions are unacceptable when the probability of the mean wind speed exceeding the given number is greater than 5%.

Table 2: The Lawson wind comfort criteria

Threshold wind speed (m/s)	Activity
4	Uncomfortable for pedestrians in the vicinity of entrance doors or sitting outside for long periods of time, such as outdoor cafes.
6	Uncomfortable for pedestrians standing or sitting for shorter periods of time, such as queuing or talking.
8	Uncomfortable for pedestrians 'leisure walking' e.g. strolling, window shopping and sightseeing.
10	Uncomfortable for pedestrians walking quickly e.g. walking to a destination, and cycling.

3.0 The local wind climate

3.1 Meteorological data

The wind data was taken from the Bureau of Meteorology automatic weather station at Melbourne Regional Office (RO)[1], which is located on the corner of La Trobe Street and Victoria Parade, approximately 1km to the west of the proposed development.

The wind speed data was rescaled to account for the difference in land surface structure between the meteorological station and the development site, and the height difference between the anemometer and the level at which people are affected (assumed to be 1.5m above ground level). The rescaling was accomplished using a logarithmic-law approximation to a neutrally stable atmospheric boundary layer profile (Pasquill-Gifford Class D) (Oke, 2006) using the equation:

$$u_z = \frac{u_*}{\kappa} \ln \frac{z}{z_0}$$

In which u_z is the wind speed at height z (1.5m for pedestrian height), u_* is the friction velocity which is based on the reference wind speed from Melbourne RO, κ is von Karman's constant ($\cong 0.4$) ans z_0 is the roughness height (taken as 2m for this site to account for physical obstructions such as cars).

Wind speeds below 0.5 m/s are registered by the anemometer as zero (calm).

3.2 Summary statistics

The wind data was analysed to assess the likelihood of uncomfortable winds, without allowing for the presence of the development. Local wind effects due to the development will be discussed in the next section.

The analysis was carried out using:

- The entire data set, representing wind conditions 24 hours a day
- A subset restricted to the hours of 7am to 7pm (business hours) when outdoor areas would be most active

3.2.1 Wind speed

Calm conditions occur only rarely (5%) during business hours, slightly more frequently (8%) during winter. Wind speeds at pedestrian height are low compared to the comfort criteria (Figure 1 on the following page). Based on wind speeds experienced at the Melbourne RO, i.e. not taking in to account acceleration caused by the built environment local to the Mother Teresa building, wind speeds are likely to be comfortable for long term sedentary activities for the majority of the time.

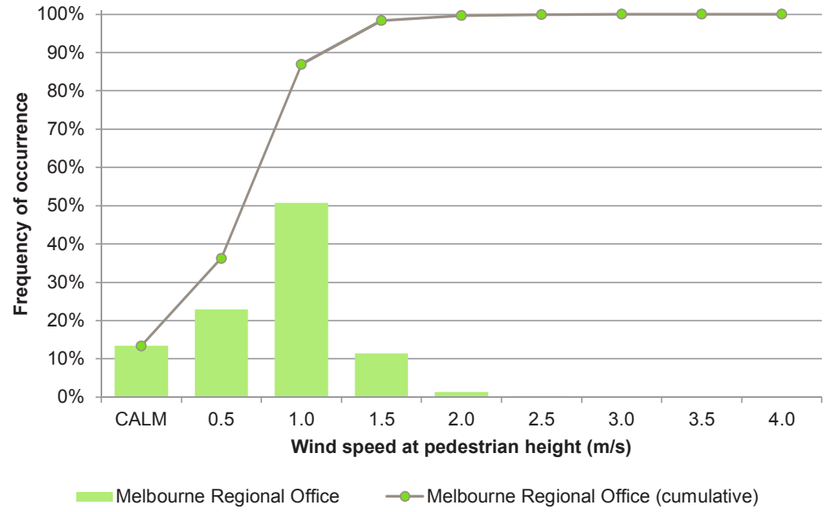


Figure 1: Distribution of wind speeds by band (bars) and cumulatively (line).

[1] Station number 086071. The data consisted of hourly wind speed and direction, maximum gust speed, temperature and other variables from 3/3/1997 to 31/8/2009. After quality checks, there were a total of 94,026 suitable records.

3.2.2 Wind direction

Figure 2 shows the frequency of winds from each direction (divided in to 10° increments) for all hours and seasons (top left), divided by season for all times of the day (top right) and divided by season during business hours (bottom). Within the CBD, there is very little variation in predominant winds between seasons, and during business hours and outside of business hours, with west south westerly winds occurring most frequently, closely followed by north easterly winds. Hence west south westerly and north easterly winds will be the focus of the assessment in section 4.0.

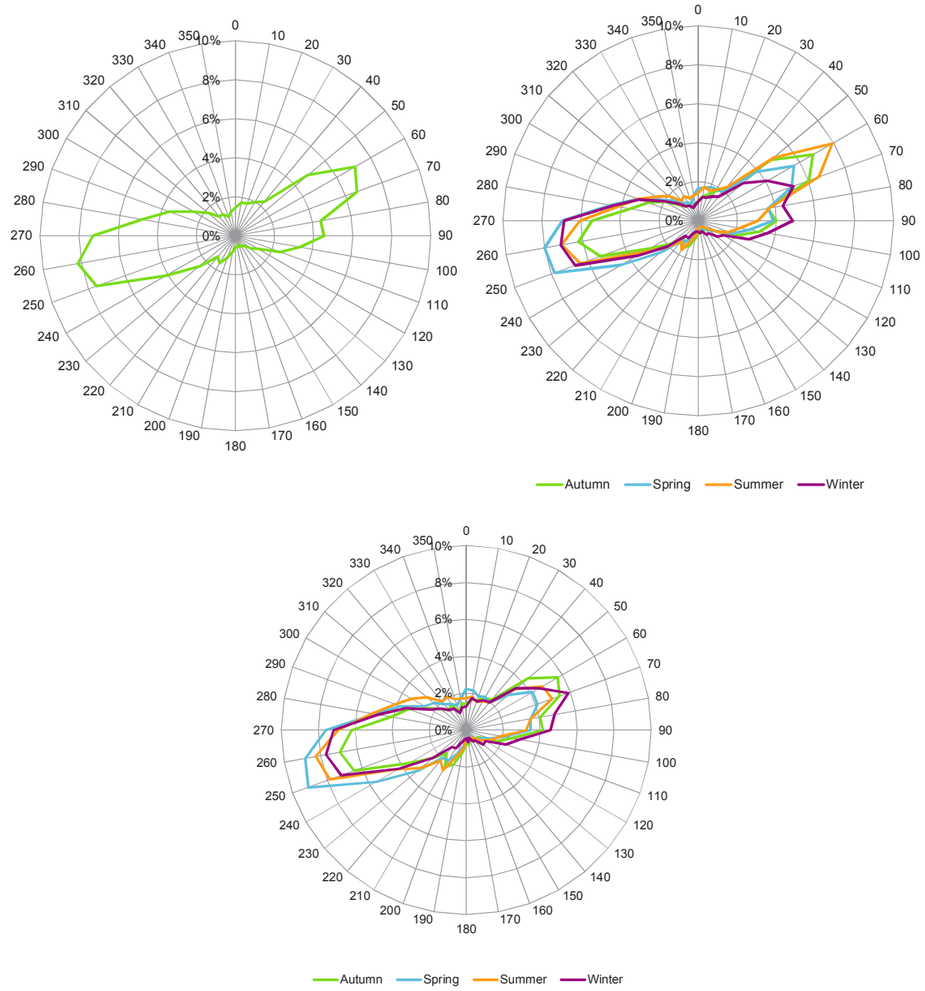
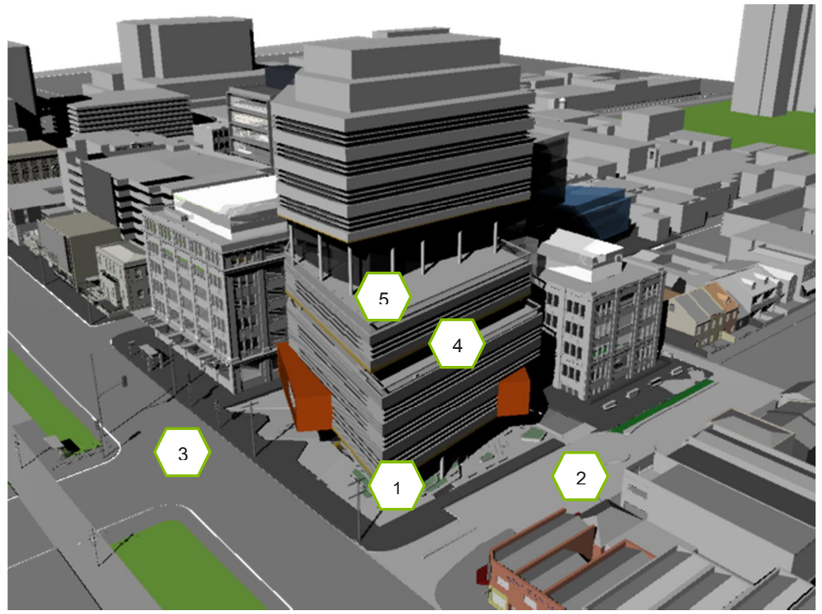


Figure 2: Distribution of wind heading for all times and seasons (top left), all times divided by season (top right), and by season during business hours (bottom).

4.0 Comfort assessment

4.1 Wind-sensitive locations

Figure 3 and Figure 4 identify the locations that are potentially sensitive to wind flows, both within the site boundary, and the impact that the proposed building may have on adjacent streets. Each location is discussed in the followings sections.



1. Ground level outdoor seating area
2. Along Napier Street
3. Along Victoria Parade
4. Level 4 Terrace
5. Level 6 Terrace

Figure 3: View from south east

6. Along Young Street
7. Along Little Victoria Street
8. Outdoor Activity Court

Figure 4: View from north west

4.1.1 Ground level outdoor seating area

This area is required to be comfortable for pedestrians sitting or standing for longer periods of time.

West south westerly winds are likely to channel along Victoria Parade from the city. Buildings on the opposite side of Victoria Parade are likely to provide little shelter, however winds are unlikely to be excessive in speed. Local mitigation features may be required, and this will be confirmed during the detailed analysis that will be carried out during the next design stage.

The adjacent buildings across Napier Street are likely to provide some shelter from north easterly winds, with down was on the eastern façade unlikely due to the staggered floor plate of the buildings and horizontal fins used for provide shade.

4.1.2 Along Napier Street

Conditions along Napier Street should be suitable for leisure walking as a minimum. The proposed building is unlikely to accelerate wind speeds above this threshold, and more detailed analysis will be undertaken during the next stage of design in order to confirm this.

4.1.3 Along Victoria Parade

Conditions along Victoria Parade should be suitable for leisure walking as a minimum. The proposed building is unlikely to accelerate wind speeds above this threshold, and more detailed analysis will be undertaken during the next stage of design in order to confirm this.

4.1.4 Level 4 Terrace

The Level 4 Terrace should be suitable for shorter periods of sitting or standing, however exposure is generally considered to be by choice and easily avoidable.

The terrace area is exposed to north easterly winds with no shelter provided by surrounding buildings are they are all considerably lower than this level. The balustrades (currently shown at around 1.6m high) will provide protection to users of this space, and an estimate of likely wind speeds will be provided in the detailed analysis in the next stage of design.

4.1.5 Level 6 Terrace

As with Level 4, the Level 6 Terrace should be suitable for shorter periods of sitting or standing, however exposure is generally considered to be by choice and easily avoidable.

This terrace is exposed to both west south westerly winds and north easterly winds, and so has the potential to experience elevated winds compared to the Level 4 Terrace, due to the depth of the terrace. Again, the balustrades (currently shown at 1.6m high) will provide protection to users, and further analysis will be provided in the next design stage.

4.1.6 Along Young Street

Conditions along Young Street should be suitable for leisure walking as a minimum. The proposed building is unlikely to accelerate wind speeds above this threshold, and more detailed analysis will be undertaken during the next stage of design in order to confirm this.

4.1.7 Along Little Victoria Street

Conditions along Little Victoria Street should be suitable for leisure walking as a minimum. The proposed building is unlikely to accelerate wind speeds above this threshold, and more detailed analysis will be undertaken during the next stage of design in order to confirm this.

4.1.8 Outdoor Activity Court

As some areas of the outdoor activity court contain searing, as with Level 4 and Level 6, the area should be suitable for shorter periods of sitting or standing, however exposure is generally considered to be by choice and easily avoidable.

Due to its height, the majority of the space is exposed to the wind speeds at the court height; approximately 4.4m/s. At this height, the wind does not experience ‘funnelling’ and the balustrade around the court provides cover from the prevailing wind. Therefore wind speeds are not expected to exceed the comfort criteria for this area.

Summary

4.2 Likelihood of discomfort

A high level desktop study of likely wind conditions around the proposed Mother Teresa building and surrounding streets has been undertaken. Due to the relatively low wind speeds experienced in this area of Melbourne, there are unlikely to be any significant adverse impacts at ground level within or surrounding the site due to the construction of this building. The staggered, non-uniform shape of the building envelope is likely to minimise wind acceleration, with horizontal shading further assisting in minimising potential issues.

The terraces on Levels 4 and 6 are relatively exposed to prevailing winds. Although the current balustrades will provide some protection, additional local mitigation measures may be required.

A detailed computational analysis will be undertaken during the next design stage which will quantify expected wind speeds and compared these against the Lawson comfort criteria.

4.3 Mitigation

No additional mitigation requirements are proposed at this stage, however smaller local features may need to be incorporated following the detailed analysis.

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ARBORICULTURAL REPORT
ARBORICULTURAL IMPACT ASSESSMENT
AUSTRALIAN CATHOLIC UNIVERSITY
115B VICTORIA PARADE, FITZROY

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October 2016

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1 INTRODUCTION

1.1 Trees within and adjacent to the Australian Catholic University, 115B Victoria Parade, Fitzroy were assessed on the 15th September, 2016. Trees within the subject site as well as trees in adjacent road reserves (Young and Napier Streets, Victoria Parade) were assessed as part of the study.

2 DISCUSSION

2.1 32 trees or tree groups were assessed as part of this study:

- 10 trees or tree groups within the subject site have been assessed of medium retention value;
- 8 trees within the subject site have been assessed of low retention value;
- 14 trees have been assessed outside the subject site.

2.2 Of the ten trees assessed within the site of medium retention value, nine are semi-mature Pin Oaks within the car park in the east of the site. These are generally developing well within a highly urbanised environment. A pair of Bangalow Palms (Tree 1) are located adjacent to the north- west corner of the car park.

TABLE 1 Trees assessed of medium retention value

No	Species	Common Name
1	*Archontophoenix cunninghamiana*	Bangalow Palm
2	*Quercus palustris*	Pin Oak
3	*Quercus palustris*	Pin Oak
4	*Quercus palustris*	Pin Oak
5	*Quercus palustris*	Pin Oak
6	*Quercus palustris*	Pin Oak
10	*Quercus palustris*	Pin Oak
11	*Quercus palustris*	Pin Oak
12	*Quercus palustris*	Pin Oak
13	*Quercus palustris*	Pin Oak

2.3 The balance of trees assessed within the site are of low retention value, Silver Birch located to the periphery of the car park. The low retention value of these trees is a reflection of their overall condition and limited existing and potential amenity value.

Australian Catholic University, 115B Victoria Parade Fitzroy October 2016
ARBORICULTURAL REPORT
ARBORICULTURAL IMPACT ASSESSMENT

TABLE 2 Trees assessed of low retention value

No	Species	Common Name
7	*Betula pendula*	Silver Birch
8	*Betula pendula*	Silver Birch
9	*Betula pendula*	Silver Birch
14	*Betula pendula*	Silver Birch
15	*Betula pendula*	Silver Birch
16	*Betula pendula*	Silver Birch
17	*Betula pendula*	Silver Birch
18	*Betula pendula*	Silver Birch

2.4 Trees assessed outside the site are street trees in the Napier Street, Young Street and Victoria Parade road reserves to the east, west and south respectively. Young Street is planted with developing Golden Robinia (Trees 19-25), their overall form reflecting the limited light between tall buildings in this section of Young Street. An older Locust (Tree 26) is located in the south west of the study area within Victoria Parade.

2.5 The west side of Napier Street is planted with a pair of semi-mature Pin Oaks (Trees 27 and 28) located in a roadside bed at the intersection of Victoria Parade, with a row of established Elms (Trees 29-32) planted in roadside cut-outs to the north of the intersection. The Elms are part of a larger avenue plantation that provide a high level of amenity to the streetscape.

TABLE 3 Trees assessed outside the site

No	Species	Common Name
19	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
20	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
21	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
22	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
23	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
24	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
25	*Robinia pseudoacacia* 'Frisia'	Golden Robinia
26	*Robinia pseudoacacia*	Locust
27	*Quercus palustris*	Pin Oak
28	*Quercus palustris*	Pin Oak
29	*Ulmus procera*	English Elm
30	*Ulmus procera*	English Elm
31	*Ulmus procera*	English Elm
32	*Ulmus procera*	English Elm

3 IMPACT OF PROPOSED DEVELOPMENT

3.1 Development of the site is proposed, including construction of a new 13 level building over basement car park in the existing car parking area. A new vehicular access is proposed from Napier Street, with changes proposed to the road functional layout of Napier Street. The following drawings have been reviewed in the preparation of these notes:

Lyons Architects ACU Development Plan October 2016;

&

Signage and Linemarking Plan. Functional Layout Plan Option 02 CG150178-TR-DG-2502 Rev 3 11.10.2016
Australian Catholic University, Napier Street, Fitzroy. City Of Yarra
Prepared by Cardno

Site Trees

3.2 All trees assess within the site will require removal to facilitate development. None are considered to be of sufficiently high value to require redesign to ensure retention.

Trees Outside the Site

3.3 Two trees outside the site, a pair of Pin Oaks (Trees 27 and 28) at the south western end of Napier Street will require removal for the revised road functional layout.

3.4 The balance of trees to the west side of Napier Street outside the development area can be retained, subject to appropriate protection conforming to AS4970-2009 *Protection of Trees on Development Sites*. The only noted encroachments by works are for :

- The basement, <1% of the tree protection zone of Tree 29.
- The basement ramp crossover, <= 3% for Tree 30, <1% for Tree 31.

3.5 All are minor encroachments under the provisions of AS4970-2009.

3.6 The road functional layout has been developed so that new kerb and channel is limited to the crossover within the tree protection zones of trees to be retained, and traffic separation within TPZs can be accomplished with line-marking and surface texturing.

3.7 There may be the potential to provide permeability through removal of bituminous concrete to portions of the west side of Napier Street (currently sealed to the kerb) to improve growing conditions for existing trees.

Australian Catholic University, 115B Victoria Parade Fitzroy October 2016
ARBORICULTURAL REPORT
ARBORICULTURAL IMPACT ASSESSMENT

3.8 A full survey of all trees is included below.

3.9 The location of each tree is shown in 7 Appendix 1 – Tree Location Plan.

4 SITE PHOTOGRAPHS

Figure 1 From right, Trees 2, 3 and 4 in the car park.

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October 2016

Figure 2 Tree 1, a pair of Bangalow Palms .

Figure 3 Tree 32 in the Napier Street road reserve.

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Figure 4 Golden Robinias in the Young Street road reserve.

5 RESULTS OF TREE SURVEY

Tree–1	***Archontophoenix cunninghamiana*, Bangalow Palm**		
Origin: Australian native	**Type:** Evergreen Broadleaf		**Age:** Semi-mature
DBH (cm): 16	**Height:** 10m	**Width:** 5m	**TPZ:** 3.5m
Crown class: Symmetrical	**Health:** Fair-Good	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:** Can be transplanted		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–2	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 35.5	**Height:** 13m	**Width:** 6m	**TPZ:** 4.3m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:** Good developing specimen		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–3	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 20.5	**Height:** 8m	**Width:** 5m	**TPZ:** 2.5m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Low	**Comments:**		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–4	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 23	**Height:** 11m	**Width:** 6m	**TPZ:** 2.8m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:** Slightly kinked trunk, otherwise good developing specimen		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

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Tree–5	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 30	**Height:** 12m	**Width:** 6m	**TPZ:** 3.6m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:**		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–6	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 31.5	**Height:** 12m	**Width:** 7m	**TPZ:** 3.8m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:** Contorted trunk. Codominant pruned out.		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–7	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 17	**Height:** 6m	**Width:** 4m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 10-20years
Amenity value: Low	**Comments:**		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–8	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 25.5	**Height:** 10m	**Width:** 6m	**TPZ:** 3.1m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 10-20years
Amenity value: Medium	**Comments:** Narrow primary union		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–9	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 18	**Height:** 9m	**Width:** 6m	**TPZ:** 2.2m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Poor	**SULE:** 0-10years
Amenity value: Low	**Comments:** Dead wood evident		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–10	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 23.5	**Height:** 9m	**Width:** 6m	**TPZ:** 2.8m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:**		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–11	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 22.5	**Height:** 8m	**Width:** 6m	**TPZ:** 2.7m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:**		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–12	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 23.5	**Height:** 8m	**Width:** 7m	**TPZ:** 2.8m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:**		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–13	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:**
DBH (cm): 31	**Height:** 8m	**Width:** 7m	**TPZ:** 3.7m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** years
Amenity value: Medium	**Comments:**		
Retention Value: Medium		**Reason:**	
Impact of Development: Remove			

Tree–14	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Senescent
DBH (cm): 0	**Height:** 5m	**Width:** 2m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Poor	**Structure:** Poor	**SULE:** 0years
Amenity value: Very Low	**Comments:** Cracks in trunk, possibly dead.		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–15	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 13.5	**Height:** 5m	**Width:** 2m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 10-20years
Amenity value: Low	**Comments:**		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–16	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 19.5	**Height:** 7m	**Width:** 5m	**TPZ:** 2.3m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 10-20years
Amenity value: Medium	**Comments:**		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–17	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 15	**Height:** 10m	**Width:** 4m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 10-20years
Amenity value: Medium	**Comments:**		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–18	***Betula pendula*, Silver Birch**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 20	**Height:** 10m	**Width:** 6m	**TPZ:** 2.4m
Crown class: Asymetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 10-20years
Amenity value: Medium	**Comments:**		
Retention Value: Low		**Reason:**	
Impact of Development: Remove			

Tree–19	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 20	**Height:** 12m	**Width:** 6m	**TPZ:** 2.4m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:** Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–20	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 17.5	**Height:** 12m	**Width:** 6m	**TPZ:** 2.1m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:** Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–21	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Juvenile
DBH (cm): <15	**Height:** 2m	**Width:** 1m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Fair-Good	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Low	**Comments:** Newly planted Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–22	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): <15	**Height:** 2m	**Width:** 1m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Low	**Comments:** Newly planted Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–23	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 13	**Height:** 12m	**Width:** 7m	**TPZ:** 2.0m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Low	**Comments:** Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–24	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 23	**Height:** 12m	**Width:** 7m	**TPZ:** 2.8m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: Medium	**Comments:** Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

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Tree–25	***Robinia pseudoacacia* 'Frisia', Golden Robinia**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 30	**Height:** 12m	**Width:** 7m	**TPZ:** 3.6m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 0-10years
Amenity value: Medium	**Comments:** Basal trunk canker and frass. Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–26	***Robinia pseudoacacia*, Locust**		
Origin: Exotic weed	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 19.5	**Height:** 6m	**Width:** 5m	**TPZ:** 2.3m
Crown class: Symmetrical	**Health:** Fair	**Structure:** Fair	**SULE:** 10-20years
Amenity value: Medium	**Comments:** Fungal bodies on trunk. Street tree		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–27	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 32	**Height:** 10m	**Width:** 9m	**TPZ:** 3.8m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:** Canyon pruned.		
Retention Value: Outside property		**Reason:**	
Impact of Development: Remove			

Tree–28	***Quercus palustris*, Pin Oak**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 34	**Height:** 13m	**Width:** 10m	**TPZ:** 4.1m
Crown class: Intermediate	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:** Canyon pruned and asymmetric		
Retention Value: Outside property		**Reason:**	
Impact of Development: Remove			

Tree–29	***Ulmus procera*, English Elm**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 34	**Height:** 13m	**Width:** 10m	**TPZ:** 4.1m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair-Good	**SULE:** 20years
Amenity value: High	**Comments:** Basal wounding.		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–30	***Ulmus procera*, English Elm**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 29	**Height:** 12m	**Width:** 6m	**TPZ:** 3.5m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 10-20years
Amenity value: High	**Comments:** Large tear-out wound east side.		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–31	***Ulmus procera*, English Elm**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 36.5	**Height:** 13m	**Width:** 7m	**TPZ:** 4.4m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: Medium	**Comments:** Lost co-dominant. Trunk wounding.		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

Tree–32	***Ulmus procera*, English Elm**		
Origin: Exotic	**Type:** Deciduous Broadleaf		**Age:** Semi-mature
DBH (cm): 33	**Height:** 11m	**Width:** 7m	**TPZ:** 4.0m
Crown class: Symmetrical	**Health:** Dormant	**Structure:** Fair	**SULE:** 20years
Amenity value: High	**Comments:** Some trunk wounds		
Retention Value: Outside property		**Reason:**	
Impact of Development: Retain			

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6 DESCRIPTORS

Tree Number: Refers to location of tree as per the plan at Appendix 1.

Botanical Name: Botanical name of species, based on nomenclature and spelling used by Spencer in *Horticultural Flora of South Eastern Australia* (vols 1-5). Where *Eucalyptus spp*. are not found in this source, nomenclature is based on *Euclid: Eucalypts of Australia* (2006). Eucalypt subspecies information is also based on this source.

While accurate tree identification is attempted, and uncertainties are indicated, some inaccuracies in tree identification may still be present – especially in certain, difficult to determine, genera (e.g. *Cotoneaster* and *Ulmus*) and with cultivars which can have similar characteristics.

Where a doubt as to exact species is indicated, the common name and origin are based on the listed species, and would change if the species were found to be incorrect.

From time to time taxonomists revise plant classification, and name changes are assigned. If it is known names have been revised post the publication of the relevant above listed source, the new nomenclature has been used.

Common Name: Common names are based primarily on names and spelling used by Spencer in *Horticultural Flora of South Eastern Australia* (vols 1-5). The source of common names is taken in the following order:

1. Single name supplied in *Horticultural Flora of South Eastern Australia*;
2. First in list of names supplied in *Horticultural Flora of South Eastern Australia*, unless another name in the list is deemed more appropriate;
3. As per name supplied in *Trees of Victoria and Adjoining Areas*;
4. Then by best known common name if not available in either source.

Common names are provided for thoroughness; the botanical name should be used when referring to the tree taxon.

Origin: **Exotic:** Tree origin is from outside the Australian mainland, Tasmania or near islands.

Australian Native: Origin is from within the Australian mainland or near islands, but outside Victoria.

Victorian Native: Origin is from within Victoria but outside the Melbourne region. This includes trees whose native range extends beyond Victoria into other states.

Melbourne: Origin is from within Melbourne, as defined by plants listed in the *Flora of Melbourne*. This includes trees also found outside Melbourne, and those only within the area at the far extent of their range.

Locally Indigenous: Tree's range includes the local area.

Weed: Trees known to show tendencies to weediness within Victoria. Based on the City of Knox weed list, Department of Primary Industries (Victoria) weed list and past experience. Trees with the addition of "(nox.)" indicate a declared noxious weed; refer to the Department of Primary Industries website for further information.

Type:

Broadleaf: Tree is a dicotyledon flowering plant.
Conifer: Tree is a cone bearing non-flowering plant.
Palm: Tree is a monocotyledon Palm (that is *Arecaceae*).
Palm Like: Tree is a monocotyledon, but is not a palm (that is not *Arecaceae*).

Deciduous: Tree seasonally loses its leaves in Victoria**.**
Evergreen: Tree maintains its leaves throughout the year.
Semi-deciduous: Tree may or may not lose its leaves, or may only partially lose them.

Age:

Juvenile: Tree is actively growing and is still in its establishment phase. Tree currently makes little contribution to the amenity of the landscape. Trees of this age are possible candidates for relocation during development.

Semi-mature: Tree is still actively growing but has reached an age and size where it is starting to make a contribution to the landscape.

The size of the tree would still be expected to increase considerably given no significant changes to the current situation.

Mature: Tree growth has slowed, and the size of the tree would not be expected to increase considerably without significant changes to the current situation (e.g. vegetation removal). Tree is not exhibiting any major signs of health or structural weakness as a result of age.

Over mature: Tree is no longer actively putting out extension growth, and is starting to show decline in health or structural stability as a result of age.

Senescent: Tree is senescing. Trees in this category may not be especially large or old, but are reaching the end of their expected life, often indicated by extreme poor health.

Height: Estimate of the tree's height in metres

DBH: The tree's trunk Diameter at Breast Height (1.4m above ground) unless specified as having been taken lower. This can be either estimated or measured as specified in the report.

Stems of multi-stemmed trees may be listed individually, or a measurement given at a lower point where the tree still has one stem. In some cases, especially where trees are not considered worthy of retention or stems are too numerous the DBH may simply be listed as "multi-stemmed".

Health: The tree's health is rated as **Good**, **Fair** and **Poor** as listed below. Tree ratings of **Fair-Good** and **Fair-Poor** indicate that the tree falls between the two categories. Dead trees are not given a rating, but are listed as **Dead**.

Ratings generally meet the following descriptions:

Good: *Tree is showing no obvious signs of poor health or stress* with a dense canopy that is free of dieback. Rot or pathogens are not obvious or are not considered to be a threat to the tree. Growth rates are acceptable.

Fair: *Tree is showing signs of reduced health or stress*. This is apparent through moderate foliage density, minor dieback, moderate stress response growth, minor to moderate rot, moderate pathogen infestation, stunted growth or a combination of the above symptoms.

Poor: *Tree is showing signs of poor health and/or severe stress.* This is apparent through either low foliage density, moderate to large-scale dieback, severe stress response growth, severe rot, severe pathogen infestation, failure of wounds to heal, overall tree decline or a combination of the above symptoms.

Note on Deciduous Species: Assessment of deciduous species can be problematic and results may vary depending on the time of year of assessment. Descriptor comments in relation to foliage density do not apply to deciduous trees assessed when dormant or entering or exiting dormancy. Time of leaf drop or bud burst and extent of bud swell may be considered in the health rating of these trees.

The ratings indicate that certain characteristics listed have, or have not been observed. Inspections do not assess the whole tree in detail for each characteristic. The comments category should be referred to for further information.

Structure:

The tree's structure is rated as **Good**, **Fair** and **Poor**. Tree ratings of **Fair-Good** and **Fair-Poor** indicate that the tree falls between the two categories.

As a general rule, the structure rating is based on the tree's likelihood of failure. However, it must be noted that this is not a full hazard or failure assessment of the tree.

Good: Tree has no obvious structural defects and is therefore not considered likely to fail.

Fair: Tree has at least one obvious structural defect, but this is considered to be manageable and of only moderate failure risk or the piece likely to fail may be small. Structural defects that may contribute to a fair rating are as follows:

- Poor branch attachment (including deadwood and large epicormics);
- Bifurcated, but with a join that is considered to be solid;
- Moderate trunk lean but without other defects;
- Minor damage to the trunk base;
- Rot or other damage starting to compromise the structure;
- History of shedding minor branches.

Poor: Tree has at least one structural defect that is severe and considered to have a relatively high risk of failure. If targets are present then defect(s) require treatment, or alternatively the tree should be removed. In some cases removal may be the only option for these trees. Structural defects that may contribute to a poor rating are as follows:

- Poor branch attachment (including deadwood and large epicormics);
- Bifurcated with swelling and/or included bark;
- Severe trunk lean associated with other defects such as injury in the plane of lean of root plate lift;
- Major damage to the trunk base or root system;
- Rot or other damage severely compromising the structure;
- History of shedding large branches.

The ratings indicate that certain characteristics listed have, or have not been observed. Inspections do not assess the whole tree in intense detail for each characteristic. The comments category should be referred to for further information.

Crown class:

Symmetrical: For the most part canopy received light from all four sides and has to potential for even foliage distribution. Canopy may or may not be symmetrical, but is not suppressed.

Asymmetrical: Canopy is shaded or suppressed with one or more sides and dominant when compared to the remainder of the tree. Also includes crowns damaged by previous shading.

Intermediate: Canopy is only receiving light from top, and while shape may be even the upper portions of the canopy dominate over the lower.

Suppressed: Canopy is completely shaded by surrounding vegetation, buildings etc.

Regrowth: Canopy comprised of regrowth. This can be from the base, but also includes branches covered with small, stress related epicormics.

Trained: Canopy has been specifically trained. This may include trees that are pollarded, coppiced or espaliered.

Trees may exhibit a combination of the characteristics above (e.g. a symmetrical canopy of basal regrowth), or may fall between two categories. The characteristic listed is considered to be the best fit at the time.

Amenity value:

Very Low: Tree makes little or no contribution to the amenity value of the site or surrounding area. In some cases the tree may be detrimental to the area's amenity value (e.g. unsightly, risk of weed spread).

Low: Tree makes some contribution to the amenity value of the site, but makes no contribution to the amenity value of the surrounding area. Removal of the tree would result in little loss of amenity. Juvenile trees (including street trees) are generally included in this category, however they may have the potential to supply increased amenity in the future.

Medium: Tree makes a moderate contribution to the amenity of the site and/or may contribute to the amenity of the surrounding area.

High: Tree makes a significant contribution to the amenity value of the site, or tree makes a moderate to significant contribution to the amenity vale of the larger landscape.

The amenity value rating considers the impact the tree has on any neighbouring sites as being of equal importance to that supplied to the

subject site. However, trees that contribute to the amenity of the general area (e.g. streetscape) are given greater weight.

Comments: Any additional comments in relation to the above categories.

SULE: The Safe, Useful, Life Expectancy of the tree from a health, structure, amenity and weediness viewpoint given no significant changes to the current situation. This category is difficult to determine, and should be taken as an estimate only, in addition to this, factors not observed at the time of inspection can lead to tree decline.

0: Tree is a hazard or a weed and should be removed immediately.

0-10: Estimated SULE of less than 10 years.

10-20: Estimated SULE of 10 to 20 years.

20: Estimated SULE of 20 years or greater.

Recommendation:

Remove: Tree is either not worthy of retention or requires removal (e.g. weed species).

Retain or Remove: Tree does not require removal, but is of low retention value.

Retain if practical: Tree has a moderate retention value and should be retained if possible during any development of the site.

Notes:

Dead: Tree is dead and should therefore be removed.

Good condition: Tree is worthy of retention based on its condition. Trees may still have some structural or health problems, but are generally worth retaining.

Good development potential: Tree is of a small size, but is considered to have a high potential to develop well. Retention of these trees should be considered as they should develop more quickly than new plantings.

Hazardous: Tree should be removed as it is hazardous.

Heritage tree: Tree is of heritage significance. Refer to the introduction for further information on any trees of heritage significance.

High landscape contribution: Tree is worthy of retention based on its contribution to the site or landscape (associated with amenity value).

Inappropriate location: The tree is not in an appropriate location for its species, size etc. Includes trees too large for their current location.

Juvenile – simple to replace: Tree does not have a high retention value as a similarly sized replacement specimen could be obtained. Alternatively, the tree is a candidate for relocation.

Limited life expectancy: Tree is in decline, or is expected to start to decline within a relatively short time period. As a result, it is not sensible to implement extensive tree protection measures to save the tree unless there are extenuating circumstances (e.g. outside ownership).

Low Amenity Value: Tree is unsightly, or has little potential to add to site amenity (e.g. a non-canopy fruit tree).

Outside ownership: Tree is located outside the subject site, and is therefore owned by another party. The tree may be in a neighbouring private property or fall within the council managed nature strip/road reserve.

It is assumed that the owner of the tree wishes to retain it, and the trees are listed as retain for that reason. The owner should be contacted for discussions if the removal of the tree is wanted. Recommendation of retention of any of these trees is based solely on the above mentioned reason, and is no indication of the tree's general worthiness for retention.

Poor condition: Tree's poor condition makes it unworthy of retention**.**

Rare / unusual species: Tree is of a species, cultivar or form (trained or otherwise) which is unusual, at least in the local area, and which has some retention value (usually amenity value). Trees of this nature may also classify as a "heritage tree".

Remnant Indigenous: The tree is a remnant indigenous specimen and therefore has environmental value. Trees of this nature, in reasonable condition are usually recommended for retention.

Senescent: Tree should be removed as it is dying.

Significant tree: The tree has been declared a significant tree by the local council, and retention is likely to be a permit requirement.

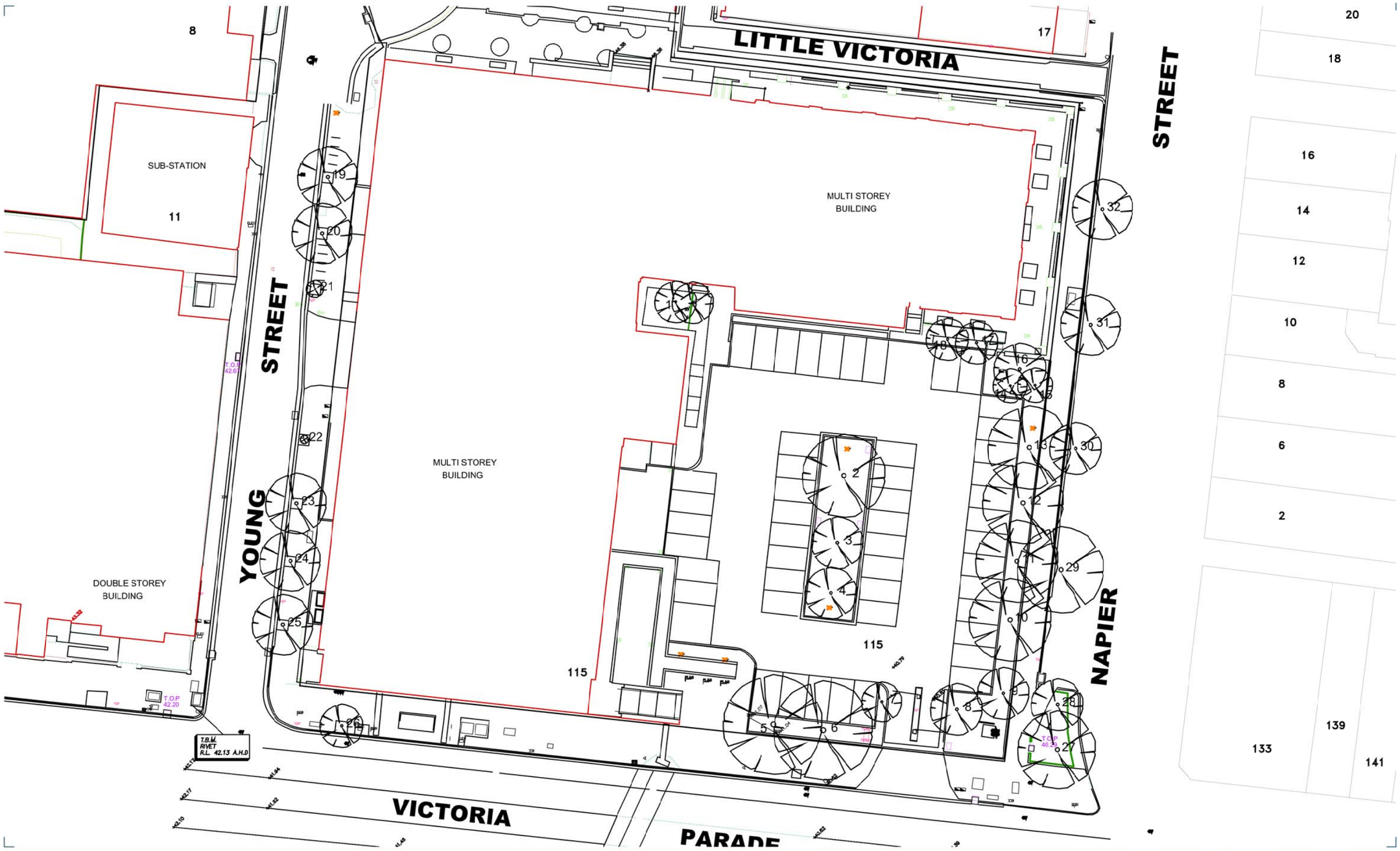
Unlikely to develop well: Tree is immature with a severe defect which will prevent its form developing as it should or tree has a severe defect, the correction of which will result in a tree shape that is unlikely to redevelop well .

Weed species: Tree should be removed due to weedy nature of the species.

TPZ: The Tree Protection Zone of the tree, measured as a radial distance in metres from the centre of the trunk. The TPZ is calculated using the method specified in *Australian Standard AS4970-2009 Protection of trees on development sites.*

TPZs are not listed for trees that are recommended for removal.

7 APPENDIX 1 – TREE LOCATION PLAN



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CLIENT
Avium Projects P/L

PROJECT
Tree Survey
Australian Catholic University
Fitzroy Campus

DRAWING
Tree Location Plan

SCALE	1:400 @ A3
DATE	OCT 2016
DRAWN	SH
CHECKED	
JOB NO	16-794
DWG NO	16-794TS-01

MELBOURNE CAMPUS
GREEN TRAVEL PLAN

Final Melbourne Green Travel Plan Dec 2017

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Introduction

The Melbourne Campus of Australian Catholic University (ACU) over the past decade has experienced high demand for its tertiary education student placements and by 2020 the campus will need to grow to accommodate 12,900 students and 1,200 staff, with further growth anticipated to 2025.

To meet that demand, ACU plans to develop its Melbourne Campus substantially within boundaries of the Development Plan in the period from the present to 2025, and this Green Travel Plan responds to the opportunity those plans present to ensure that staff, students and visitors to the campus can choose to commute to campus using one or more of its public-transport, cycling, pedestrian and vehicle transport links, with an emphasis on modes other than single-occupancy vehicle travel.

The additional 160 bicycle lock-up points will be provided within the Development Plan area, and will supplement the existing 214 bike lock up points already in place on the Melbourne Campus. The maximum of 270 below-ground car-parking spaces (including 3 accessible spaces), will replace 300 existing car parking spaces within the Development Plan area, consisting of the fifty above-ground car-parks located at 115b Victoria Parade and the 250 car parking spaces in the multi-storey Young Street car park, which ACU will demolish and replace with a building and outdoor open space that serves as a campus hub, with arts and sporting functions.

Background

ACU is committed to increasing the sustainability of its operations. It has one of the smallest environmental footprints of any Australian University and is committed to an extensive program of outreach to communities in need, both local and global.The Melbourne Campus has one of Australia's first 6-Star Green Star Education buildingsSimilarly, students and staff at the Melbourne Campus are closely involved in partnerships to support local and overseas communities, including courses of University study designed specifically for people experiencing multiple disadvantage and social isolation, homework support programs and public health programs in Timor Leste and Cambodia.

Meanwhile, the growth of the Melbourne Campus has increased student, staff and visitor demand for access to the campus, increasing transport-related impacts that ACU naturally seeks to limit or minimise.

Those impacts include the additional greenhouse and other harmful emissions associated with vehicle commuting to the Campus; the demand for parking space on a site with limited capacity to accommodate above-ground parking; and the challenge to maintain amenity of the campus and its immediate surrounds for the benefit of the University's students and staff and also its neighbours.

Equally, the campus's transport challenges present an opportunity for ACU to demonstrate its commitments not only to operational sustainability but also to the local community and to the health and wellbeing of its students and staff.

Final Melbourne Green Travel Plan Dec 2017

Existing Transport Policy Context

Summary of key policy directions

Local and State and ACU's own transport policies describe several themes important to ACU's transport management. Those themes are described below:

Safety: ACU's concern for the safety of its students, staff and visitors is paramount; safe access to and from campus, including through a reduction of vehicle traffic on campus, is a key way to achieve that.

Health and wellbeing: research has established that active transport (walking and cycling) benefits physical and mental health

Choice and accessibility: some transport modes are not equally available to all members of the community, nor are all modes desirable for everyone, so it is essential that ACU ensures that staff, students and visitors can access its campuses using a range of transport modes

Environmental impacts: vehicles are a source of many environmental pollutants, including greenhouse gases, particulates and volatile organic compounds, and a reduction in their use anywhere delivers not only a local but also a global benefit.

Amenity: sustainable transport options such as public and active transport can improve the amenity of spaces close to campuses, providing benefits to the campus and to its neighbours

Existing Policy Framework

The key policies relevant to ACU's transport management are tabulated below:

	Policy	Purpose of the strategy or policy
ACU	Green Travel Policy	Increase mode-share of all transport modes other than single-occupant cars
	Parking Policy	To provide a consistent and equitable approach to car parking for staff, students and visitors at all ACU campuses
	Sustainability Policy	To increase the sustainability of ACU by reducing its environmental impacts and promoting social equity
	Sustainability Framework	To place and to account for the full range of actions that ACU takes to increase its sustainability
City of Yarra	Yarra Environment Strategy – pathway 3	To develop a secure, affordable and liveable City infrastructure and lifestyles for the Yarra Community, with specific objectives such as sustainable transport and communities resilient to climate change
	Proposed Council Plan 2017-2021	(Objective 6) (to provide a city in which) connectivity and travel options are environmentally sustainable, integrated and well-designed: - Improve the city's sustainable transport capacity to accommodate its projected 33% population growth by 2031; - To encourage public transport, walking or cycling as the first choice of transport for all ages for short to medium trips (≤5km) - Advocacy to State and Federal governments to improve their transport policies with the objective of reducing congestion on the City of Yarra's roads - To balance the need for road space, including parking, for all road users
Victorian Government	Cycling into the Future	To support and encourage cycling as an important transport mode for improving the following challenges: - reducing physical inactivity among Victorians - improving mobility within and between communities - vehicle congestion on roads - reduced air pollution
	Principal Pedestrian Network development	Victorian Department for Economic Development, Jobs, Transport and Resources guidelines to assist local councils develop principal pedestrian networks (PPNs):
	Plan Melbourne	A policy that will guide the growth of Melbourne from 2017 until 2050. It sets the strategy for supporting jobs, housing and transport, and identifies St Patrick's Campus as a place of State significance for health and education purposes.

Transport conditions

Bicycle infrastructure

Bicycle routes

The ACU Melbourne Campus is served by several significant cycling routes that connect the campus to the Principal Bicycle Network, the set of arterial cycling routes in metropolitan Melbourne.

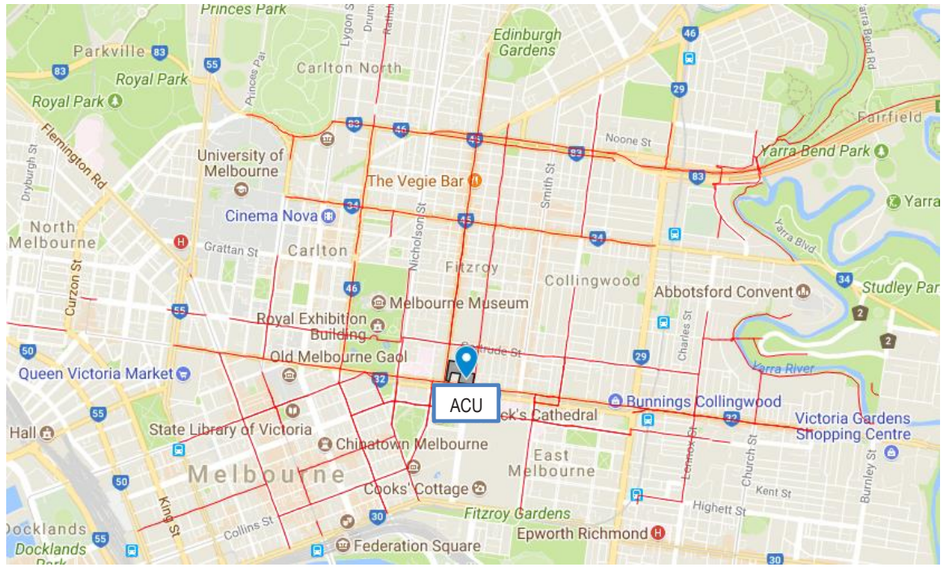

Figure 1 - The ACU Campus within the bicycle routes of the Principle Bike Network

On-campus bicycle facilities

ACU Melbourne Campus has 214 bike lock-up points at present, and the Development Plan will provide an additional 160 for a total of 374 within the boundaries of the Campus.

The existing bicycle parking points are located in the following locations:

Location	Number of bike lock-up points
St Mary of the Cross Square	22
Ground floor, The Daniel Mannix Building	81
Graduate's Walk	54
Christ & Mercy Lecture Theatre, Young St West	14
Mary Glowrey Bld, Young St East	18
Multi-Storey Carpark, Young & Little Victoria St	25

The Campus also has extensive end-of-trip facilities, including 186 lockers and 16 male showers and 20 female showers available to students and staff. These are located in the following locations:

Location	Male Lockers	Male Showers	Female Lockers	Female Showers
Basement, The Daniel Mannix Building	57	6	57	6
Basement, Mary Glowrey Building	36	10	36	14

Additional end of trip facilities will be considered for new buildings within the Development Plan at the Planning Permit stage.

Pedestrian infrastructure

The pedestrian infrastructure surrounding the ACU Melbourne Campus is excellent, with well-maintained footpaths available on all roads and streets in the vicinity of the campus.

The Campus is linked to the following major pedestrian routes:

1. Victoria Parade
2. Brunswick Street
3. Smith Street
4. Gertrude Street
5. Landsdowne Street

Signalised pedestrian crossings to the Melbourne Campus are located at the following sites:

1. The intersection of Victoria Parade and Brunswick Street, 160m west of the main entrance to the Mary Glowrey Building at 115 Victoria Parade;
2. The intersection of Victoria Parade and Landsdowne Street, 10m south of the main entrance to the Mary Glowrey Building.

Both sets of pedestrian crossings link the Melbourne Campus with key tram stops and Parliament Station, which is 750m to the south-west.

Additional pedestrian access to the campus is available from Young Street; from the eastern side of Brunswick Street; from Little Victoria Street; and from Napier Street.

Public transport infrastructure

The Melbourne Campus and its vicinity is serviced by nearly 20 bus routes, five tram routes, and a City Loop train station. These are described in the tables below:

Buses

Route	Route	Nearest stop from campus
302	City - Box Hill via Belmore Rd & Eastern Fwy	Cnr Young St & Victoria Pde
303	City - Ringwood Nth via Park Rd	Cnr Young St & Victoria Pde
304	City - Doncaster SC via Belmore Rd & Eastern Fwy	Cnr Young St & Victoria Pde
305	City – The Pines SC via Eastern Fwy	Cnr Young St & Victoria Pde
309	City – Donvale via Reynolds Rd	Cnr Young St & Victoria Pde
318	City – Deep Creek	Cnr Young St & Victoria Pde
350	City – La Trobe University via Eastern Fwy	Cnr Young St & Victoria Pde
402	Footscray – East Melb via Nth Melb	Cnr Victoria Pde & Nicholson St
684	Eildon – Melb via Lilydale Station	Cnr Victoria Pde & Nicholson St
905	City – The Pines SC via Eastern Fwy Templestowe	Cnr Victoria Pde & Nicholson St
906	City - Warrandyte via The Pines SC	Cnr Victoria Pde & Nicholson St
907	City – Mitcham via Doncaster Rd	Cnr Victoria Pde & Nicholson St
908	City – The Pines SC via Eastern Fwy	Cnr Victoria Pde & Nicholson St

Trams

Route	Route	Nearest stop from campus
11	West Preston – Victoria Harbour Docklands	St Vincent's Plaza
12	Victoria Gardens – St Kilda	St Vincent's Plaza
30	St Vincent's Plaza – Docklands via La Trobe St	St Vincent's Plaza
86	Bundoora RMIT – Waterfront City, Docklands	Cnr Gertrude Street & Napier St
96	East Brunswick – St Kilda Beach	Cnr Victoria Pde & Nicholson St
109	Box Hill – Port Melbourne	St Vincent's Plaza

Train

The Nicholson Street entrance to Parliament Station is situated 750m from the Mary Glowrey Building at 115 Victoria Parade (an approximately 10 minute walk). Parliament station provides access to all Metropolitan train services

Development Plan Area Car and Bicycle Parking

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Car Parking

The Development Plan area will provide up to a maximum of 270 car parks, including up to 15 car parks fitted for electric-vehicle recharging.

Bicycle parking

The Development Plan area will include 160 additional bike lock-up points, which provides:

- Approximately one secure bike park to every 12 equivalent full-time students enrolled at the campus, or
- One secure bike park for every nine equivalent full-time students at 75% occupancy.

These 160 bike lock-up points add to the Melbourne Campus's existing 214 secure bike parks providing for the whole campus:

- Approximately one secure bike park to every 20 equivalent full-time students enrolled at the campus, or
- One secure bike park to every 14 equivalent full-time students at 75% occupancy.

Green Travel Plan Objectives

The primary objective of this plan is to reduce the number of trips to and from campus by vehicles with just one occupant.

The supporting objectives are as follows:

1. To increase the number of journeys to and from campus by walking, cycling and public transport
2. To improve the quantity and quality of on-campus end-of-trip facilities necessary to support those who choose active transport modes
3. To provide incentives for walking, cycling and public transport to ACU Melbourne
4. To communicate the benefits of walking, cycling and public transport travel modes to students, staff and visitors to campus
5. To provide accurate and comprehensive information to enable students, staff and visitors to choose active transport modes to commute to and from the campus

The Melbourne Campus is sited within a dense network of public transport, cycling and pedestrian routes and this plan aims to increase the already large number of students and staff who use these routes.

ACU will take a range of actions in order to provide incentives so that:

a. Those staff and students who already prefer these routes continue to do so;
b. Those staff who ride-share continue to do so, or increase their use of active and public transport; and
c. All other staff and students are supported with information, advice and facilities that support a decision to commute other than as the sole occupant of a vehicle

Green Travel Actions

Incentivise walking, cycling, public transport

1. Continue to increase the quantity and quality of end of trip facilities on campus
2. Ensure the design of the campus and its buildings supports simple, safe and sign-posted access to and from cycling routes
3. Survey staff to identify demand for novated leasing of electric bicycles
4. Install a second bike-repair station on campus consisting of a repair stand; puncture repair equipment; tyre pump and spare lights
5. Conduct a review of nearby bike routes and foot-paths for serviceability and safety and liaise with the City of Yarra on findings
6. Identify a local bicycle shop to supply discounted goods and services to ACU students and staff
7. Establish a bike-buddy scheme to support new cyclists to adopt cycling
8. Maintain support for the Campus's staff Commuter Club, a payroll deduction program for the purchase of Myki tickets
9. Promote and encourage the use of the Melbourne Bike Share within the University, including consideration of signage directing students and staff to the Melbourne Bike Share pod to e located on Victoria Parade.

Increase student and staff awareness of alternative transport choices

Implement a dedicated active travel communications program, to be delivered through a range of communication channels to students and staff, including events such as Ride to Work Day.

See appendix A for the communication program for this plan.

Incentivise and enable ride-sharing:

Initiate a ride-sharing program using an online platform and associated promotional and enabling events, such as post-code morning teas for staff and parking incentives.

Management, measurement and reporting

Management

The Director of Properties and Facilities is responsible for the implementation of this Green Travel Plan.

Measurement

ACU will measure the following in order to effectively manage its green travel program:

1. The number of staff who access the Commuter Club
2. Attendance at travel promotional events such as Ride-to-Work or Ride-to-University Day
3. Participation in the bike-buddy program
4. Unique visits to travel webpages on staff and student web-portals
5. Transport mode share surveys (see appendix B for details of the mode share survey methodology)

Reporting

ACU will prepare reports of data collected for this Green Travel Plan and present that report to Campus Board.

Appendix A: Green Travel Communication Plan

General

This is a plan that describes the internal communications material that will publicise the green travel modes that staff and students can use to commute to and from ACU's Melbourne Campus, as well as the benefits that attend and facilities that support their choice of green travel modes.

The plan describes the communication material and a list of the timings for the publication of communication material, the target audience of each, and its intended channel.

Object of this plan

The object of this plan is to detail the audiences, key messages, channels, content and the publication schedule for the Melbourne Campus Green Travel program. Each of the projects in the sustainability program has its own communication program to complement this overall plan.

Target audiences

The target audiences are shown below in their segments:

- Staff
- Students
- Contractors (cleaning; catering; and maintenance)
- Visitors (to campus clinics; to public events)
- By usual choice of travel mode (public transport; single occupant car ride; shared car-ride; cyclists; pedestrians)

Key messages:

1. Cycling and walking to Campus will save money and improve your health and wellbeing
2. If you cycle to Campus you will find lockers and clean showers and a safe place to lock up your bike
3. There are many ways to get to Campus. Find out more at:
    - Staff intranet: Melbourne Campus Transport Information
    - Student portal: Melbourne Campus Transport Information

Communication channels and content

The Green Travel communication program will use the communication channels listed below to connect to its key audiences. The appendices to this plan provide details on how the program will use each of those channels.

	Channels	Communication products	Publication or event date
Digital	Staff intranet	Sustainability information, including an ACU Guide to Green Commuting Travel information relevant to each campus, including links to Transport Authority journey planners	Published; reviewed frequently for currency.
	Student Web Portal	Travel information relevant to each campus, including links to Transport Authority journey planners	Published; reviewed frequently for currency.
	ACU External Social Media	ACU Facebook	Publication of information in support of green travel events (see below)
	ACU Internal Social Media	ACU Workplace by Facebook	
	Campus LCD Monitors	Digital posters	
Interpersonal	Events	Ride to Uni Day Staff induction Student orientation	October, annually As scheduled February and July, annually
Internal media	Staff Bulletin	News articles	Publication of information in support of green travel events (see below)

Appendix B: Measurement of Transport Mode Share

It is proposed to survey transport mode at intervals at the Melbourne Campus, to establish benchmark data. This survey will consist of observations of staff and student travel behaviour and interviews with a sample of staff and students.

When initiated, the surveys will occur at the start of each semester, over a period of five days, when student attendance at the Campus peaks. The surveys will count the number of students, staff and visitors and contractors who arrive and depart the campus, and the transport mode by which they do so.

Those transport modes subject to the survey are train, bus, tram, car driver, car passenger, walking and cycling, and the survey methodology must aim to capture the following information:

1. The number of cars arriving and departing from each campus car park
2. The number of staff and students who park in off-site car-parking
3. The number of passengers in each car, whether it parks on- or off-site
4. The number of people who arrive on foot, bicycle or public transport
5. The number of people who are neither staff nor students who use ACU car-parks

On-site modal share

Surveyors will conduct counts at the campus points of access, as detailed in table 1 below:

Survey Location	Modes
Young Street Car Park	Cars and motorbikes
St Mary of the Cross Square	Pedestrians; cyclists and public transport users
Cathedral Hall, Brunswick Street Entrance	
Building 400 (81-89 Victoria Parade)	
Mary Glowrey Building Victoria Pde Entrance	Pedestrians; public transport users
Christ and Mercy Lecture Theatres	Pedestrians; cyclists and public transport users
The Daniel Mannix Building, Young St entrance	
Mary Glowrey Building Little Victoria Street Entrance	

Notes:

1. The vehicle count must include the number of passengers in each vehicle, in order to account for the number of drivers and passengers;
2. The building loading docks may be excluded from the survey because it is not a critical access point and its use is not targeted by this plan;

3. An attempt must be made to discount the number of pedestrians and cyclists who use the campus as a thoroughfare, with surveyor resourcing sufficient to enable this count;

Off-site modal share

To identify the number of staff and students who are parking off-site or arriving by tram, train or bus in the vicinity of the campus it is necessary to undertake surveys by interview, to supplement and complement the entry and exit counts.

Surveyors will request that pedestrians arriving at the Campus respond to a short survey by interview or by touch-screen electronic device to determine the following:

1. Whether he or she is a staff member or a student
2. Mode of travel
3. If a driver, the location of their parked car

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