

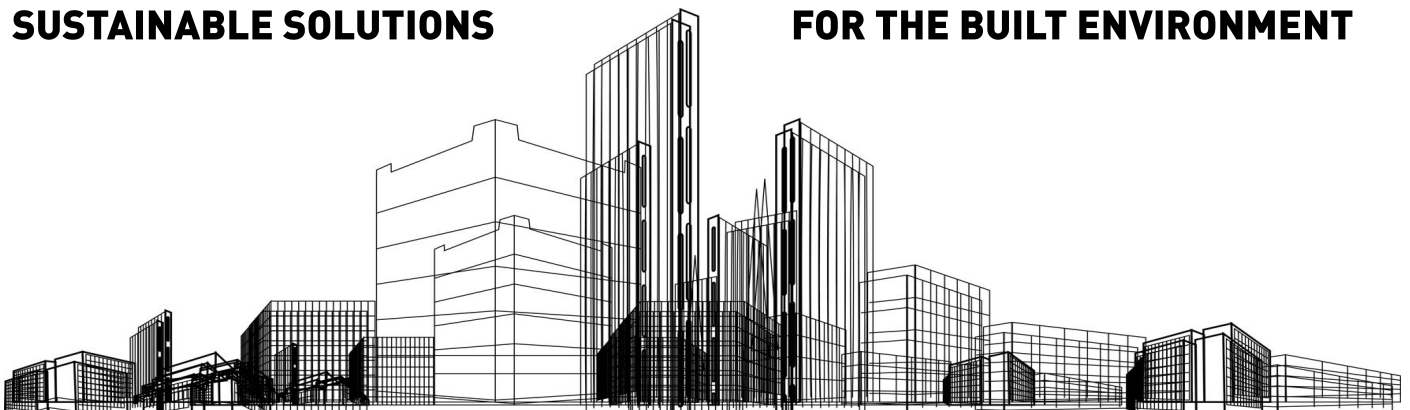
CATHERINE MCAULEY COLLEGE - JOINT USE DEVELOPMENT AND REGIONAL CRICKET HUB

SUSTAINABILITY MANAGEMENT PLAN FINAL VERSION 2

4TH DECEMBER, 2019

SUSTAINABLE SOLUTIONS

FOR THE BUILT ENVIRONMENT





Date: 4/12/2019
Project Number: PJ460
Project Title: Catherine McAuley College – Joint Use
Development and Regional Cricket Hub

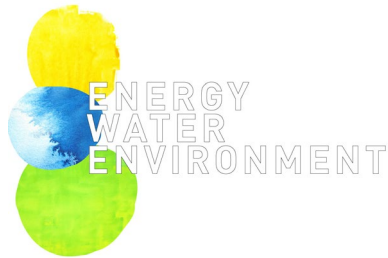
To: Graham Bennett (Clarke Hopkins Clarke)
Greater Bendigo City Council

From: Patrick Phelan

Document Title: Sustainable Management Plan Final Version 2

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1. Executive Summary

The purpose of this Sustainable Management Plan (SMP) is to show the sustainable design initiatives proposed for the Catherine McAuley College – Joint Use Development and Regional Cricket Hub at the planning stage. The school is located at 1 St Vincents Road Bendigo. It is subject to the ESD requirements of Greater Bendigo City Council. At the planning stage, the proposed development has been assessed against Greater Bendigo City Council Planning Scheme requirements and the National Construction Code energy efficiency regulations.

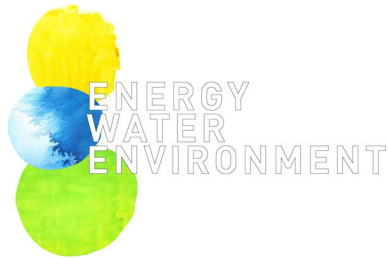
Table 1 below is a checklist showing compliance with the various environmentally sustainable design requirements.

Table 1 : SMP Checklist for Catherine McAuley College – Joint Use Development and Regional Cricket Hub

Item	In Documents / Will be achieved	Required / Recommended by	Reference if Applicable
JV3 Assessment for all conditioned components of the development	✓	National Construction Code and BESS	Refer to Section 3.2 and Appendix A
Water Sensitive Urban Design	✓	Greater Bendigo City Council planning scheme	Refer to Section 4.4 and Appendix B.2.
BESS sustainability tool assessment	✓	Greater Bendigo City Council planning scheme	Refer to Section 3.3 and Appendix B
the ISMAPNG Sustainability Policy: Sustainable Living	✓	Institute of Sisters of Mercy Australia and Papua New Guinea	General Throughout Document
An SMP describing sustainable initiatives for the development, targets and implementation	✓	Greater Bendigo City Council planning scheme	Refer to Section 4
A Green Travel Plan	✓	Greater Bendigo City Council planning scheme	Refer to Appendix D

The implementation of the initiatives within the Sustainable Management Plan are the responsibility of the design team, the Catherine McAuley College and the lead and sub-contractors.

Where operational practices are required they will be carried out by the management of the Catherine McAuley College – Joint Use Development and Regional Cricket Hub.



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2. Introduction

The purpose of this Sustainable Management Plan (SMP) is to show the sustainable design initiatives proposed for the Catherine McAuley College – Joint Use Development and Regional Cricket Hub at the planning stage. The school is located at 1 St Vincents Road Bendigo. It is subject to the ESD requirements of Greater Bendigo City Council. At the planning stage, the proposed development has been assessed against Greater Bendigo City Council Planning Scheme requirements and the National Construction Code energy efficiency regulations.

3. Performance Requirements

3.1 National Construction Code 2016 Part J – Class Type

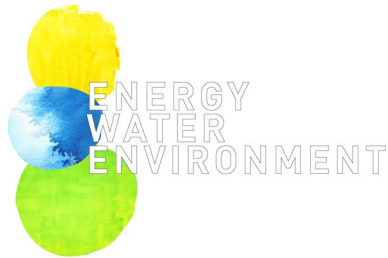
This development is a mixed use development and contains the following class types (to ultimately be confirmed by the building surveyor):

- Class 9b general purpose space

As a part of further iterations of the ESD reports and submissions, JV3 modelling shall show compliance with the NCC Part J.

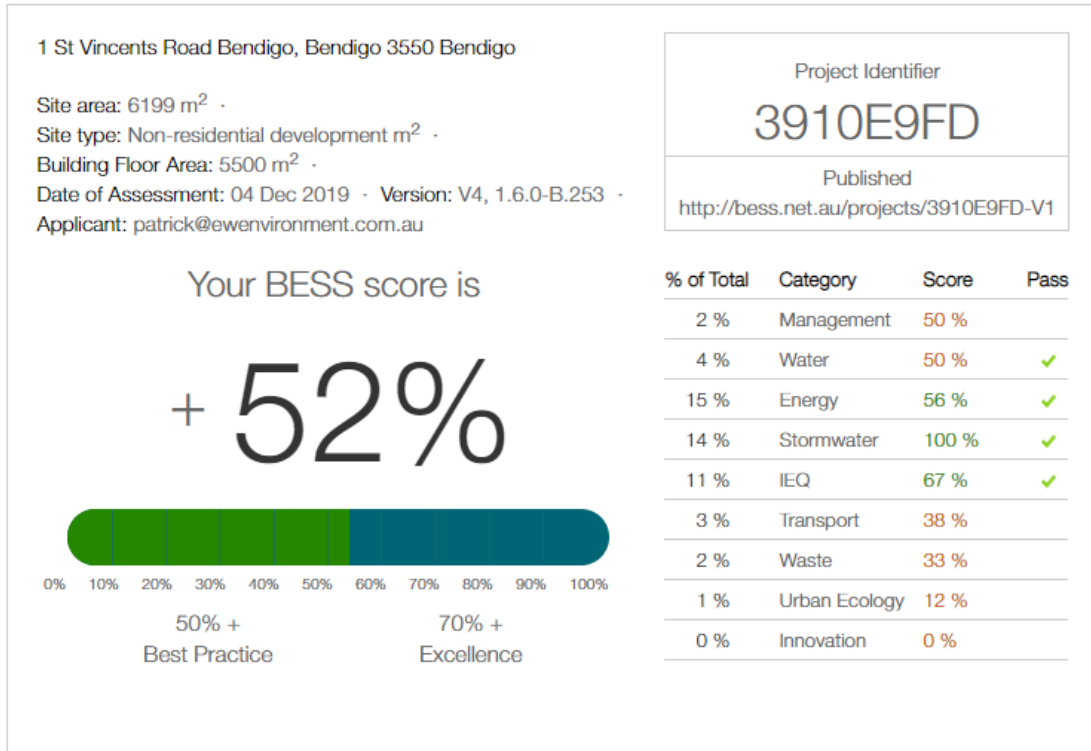
3.2 BESS Assessment

Built Environment Sustainability Scorecard (BESS) is an assessment tool created by CASBE council which is now widely used to benchmark proposed residential building developments. Based on the initiatives listed in Section 4 below, an initial BESS assessment has been undertaken for the Catherine McAuley College – Joint Use Development and Regional Cricket Hub design. The results of the BESS assessment are shown on the overleaf.

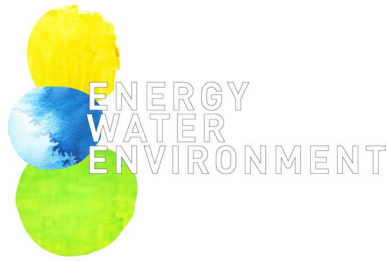


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Table 2 : BESS Minimum Requirements and Calculated Scores for Catherine McAuley College – Joint Use Development and Regional Cricket Hub SMP Design



Refer to Appendix B.1 and B.2 for the BESS and MUSIC calculations respectively.



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4. ESD Initiatives

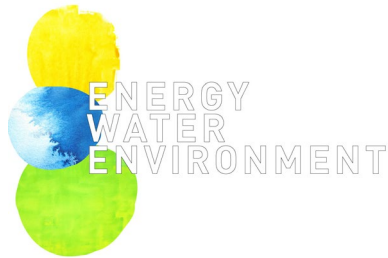
The following sections outline the ESD initiatives and management processes that are proposed for the Catherine McAuley College – Joint Use Development and Regional Cricket Hub development. These are based on consideration of the following categories:

- Indoor Environment Quality (IEQ)
- Energy Efficiency
- Water Efficiency
- Stormwater Management
- Building Materials
- Transport
- Waste Management
- Urban Ecology
- Innovation
- Construction and Building Management

Each of the above categories have been broken down into sub-categories and then into particular initiatives in the tables below.

The implementation of the initiatives within the Sustainable Management Plan are the responsibility of the design team, Catherine McAuley College and the lead and sub-contractors.

Where operational practices are required they will be carried out by the management of Catherine McAuley College.

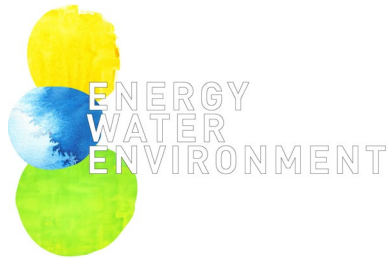


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4.1 Indoor Environment Quality (IEQ)

Table 3 : IEQ Sub-Categories and Initiatives

IEQ Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target	Schedule of Initiatives and Responsibility
Daylight	<ul style="list-style-type: none"> Habitable spaces achieve over 70% of area coverage over daylight factor of 2% 	<ul style="list-style-type: none"> BESS benchmarking Refer to Appendix C for daylight calculations 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder, window contractor
Hazardous Materials	<ul style="list-style-type: none"> No hazardous waste shall be used in construction materials 	<ul style="list-style-type: none"> No hazardous waste shall be used in construction materials 	<ul style="list-style-type: none"> Implemented as part of construction of design drawings (mechanical contractor responsibility)
Acoustics	<ul style="list-style-type: none"> All mechanical equipment shall meet the Australian Standards for noise levels 	<ul style="list-style-type: none"> To meet Australian Standards for noise levels 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder
Product Choice	<ul style="list-style-type: none"> In cases where the developer / builder specify paints, flooring and adhesive they will be low VOC to Green Star standards 	<ul style="list-style-type: none"> Green Design and As Built VOC tables 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder, carpet supplier, all trades working with adhesives internally
Natural Ventilation	<ul style="list-style-type: none"> Openable doors and windows. 	<ul style="list-style-type: none"> Achieve NCC requirements 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder



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4.2 Energy Efficiency

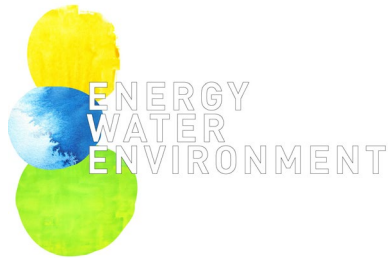
Table 4 : Energy Efficiency Sub-Categories and Initiatives

Energy Efficiency Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Operating Energy and Building Fabric	<ul style="list-style-type: none"> JV3 assessment shows an improvement of over 10% of NCC Part J benchmarks 	<ul style="list-style-type: none"> 10% improvement on NCC Part J 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder
Heating and Cooling	<ul style="list-style-type: none"> Cooling shall be provided via VRF systems to all habitable spaces. The nominated COP for the systems is minimum 3.2. 	<ul style="list-style-type: none"> COP of 3.2 	<ul style="list-style-type: none"> Design phase: Architect, mechanical designer Construction phase: Builder, mechanical contractor
Energy Sub-Metering	<ul style="list-style-type: none"> All buildings and distinct areas shall be sub-metered 	<ul style="list-style-type: none"> All areas to be metered and monitored 	<ul style="list-style-type: none"> Design phase: Architect, Electrical Designer Construction phase: Electrical Contractor
Lighting Power Density	<ul style="list-style-type: none"> Lighting power density shall be 20% lower than those stipulated by the National Construction Code in Part J6 for all NCC class types components. LED lighting will be implemented 	<ul style="list-style-type: none"> National Construction Code requirements. BESS benchmarking (refer Appendix B.1) 	<ul style="list-style-type: none"> Design phase: Architect, Electrical Designer Construction phase: Electrical Contractor
Domestic Hot Water	<ul style="list-style-type: none"> Domestic hot water shall be electric heat pump hot water 	<ul style="list-style-type: none"> BESS benchmarking (refer Appendix B.1) 	<ul style="list-style-type: none"> Design phase: Architect, hydraulic designer Construction phase: Hydraulic contractor
External Lighting	<ul style="list-style-type: none"> External lighting will be controlled via a time switch and motion detection 	<ul style="list-style-type: none"> BESS benchmarking (refer Appendix B.1) 	<ul style="list-style-type: none"> Design phase: Architect, Electrical Designer Construction phase: Electrical Contractor

4.3 Water Efficiency

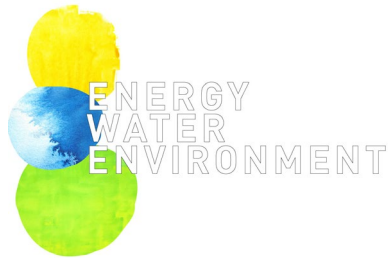
Table 5 : Water Efficiency Sub-Categories and Initiatives

Water Efficiency Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target	Schedule of Initiatives and Responsibility
Minimising Amenity Water Demand	<ul style="list-style-type: none"> The fittings and fixtures proposed for the development will meet the following Star Ratings under the Water Efficiency Labeling Scheme: 	<ul style="list-style-type: none"> As per star rating targets specified. BESS benchmarking (refer Appendix B.1) 	<ul style="list-style-type: none"> Design phase: Architect / Hydraulic Designer Construction phase: Builder and



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	<ul style="list-style-type: none"> ▪ Toilets – 4 Star ▪ Urinals – 6 Star ▪ Basin Taps – 6 Star ▪ Kitchen Taps – 5 Star ▪ Showers – 3 Star (between 6 and 7.5 l/min) ▪ Dishwashers – 4 Star ▪ Washing Machines – 5 Star 		hydraulic contractor
Rainwater Harvesting	<ul style="list-style-type: none"> ▪ A 10,000 litre rainwater tank will be implemented and will be connected to roof drainage. The water will be used to flush toilets. 	<ul style="list-style-type: none"> ▪ Flush all toilets. 	<ul style="list-style-type: none"> ▪ Design phase: Architect / Hydraulic Designer ▪ Construction phase: Builder and hydraulic contractor
Heat Rejection Water	<ul style="list-style-type: none"> ▪ Air conditioning units shall use air-cooled condenser components. 	<ul style="list-style-type: none"> ▪ No water to be used in cooling. 	<ul style="list-style-type: none"> ▪ Design phase: Architect / Mechanical Designer ▪ Construction phase: Builder and Mechanical Contractor

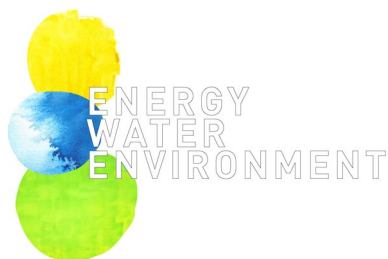


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4.4 Stormwater Management

Table 6 : Stormwater Management Sub-Categories and Initiatives

Stormwater Management Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target	Schedule of Initiatives and Responsibility
MUSIC rating	<ul style="list-style-type: none"> ▪ The calculated MUSIC results are as follows: ▪ Flow Reduction – 12% ▪ Suspended Solids – 92% ▪ Phosphorus – 72% ▪ Nitrogen – 54% Refer to Appendix B.2 for a summary of the Stormwater Management Plan.	A minimum of: <ul style="list-style-type: none"> ▪ Suspended Solids – 80% ▪ Phosphorus – 45% ▪ Nitrogen – 45% 	<ul style="list-style-type: none"> ▪ Design phase: Architect / ESD Consultant / Hydraulic Designer / Civil Designer / Landscape Consultant ▪ Construction phase: Builder, civil contractor, landscape contractor and hydraulic contractor
Discharge to Sewer	<ul style="list-style-type: none"> ▪ Low flow fittings and fixtures shall be used and shall reduce the discharge to sewer. 	<ul style="list-style-type: none"> ▪ The fittings and fixtures proposed for the development will meet the following Star Ratings under the Water Efficiency Labeling Scheme: <ul style="list-style-type: none"> ▪ Toilets – 4 Star ▪ Urinals – 6 Star ▪ Basin Taps – 6 Star ▪ Kitchen Taps – 5 Star ▪ Showers 3 Star (between 6 and 7.5 l/min) 	<ul style="list-style-type: none"> ▪ Implemented as part of construction of design drawings (contractor responsibility)
Watercourse Pollution	<ul style="list-style-type: none"> ▪ Rainwater harvesting and a stormwater retention basin are the proposed initiatives for the development to meet the watercourse pollution requirements of Council. Refer to Appendix B.2 for a summary of the Stormwater Management Plan. 	A minimum of: <ul style="list-style-type: none"> ▪ Suspended Solids – 80% ▪ Phosphorus – 45% ▪ Nitrogen – 45% 	<ul style="list-style-type: none"> ▪ Design phase: Architect / ESD Consultant / Hydraulic Designer / Civil Designer / Landscape Consultant ▪ Construction phase: Builder, civil contractor, landscape contractor and hydraulic contractor



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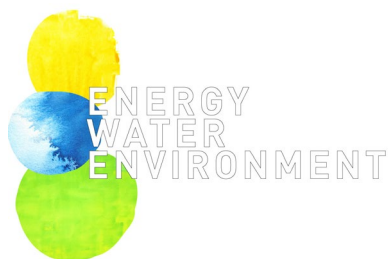
4.5 Building Materials

Table 7 : Building Materials Sub-Categories and Initiatives

Building Materials Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target and Implementation	
Storage for Recycling Waste	<ul style="list-style-type: none"> Appropriate bin storage space including space for recycling bins has been allocated. 	<ul style="list-style-type: none"> Refer to Waste Management Plan for details. 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder
Environmental Toxicity	<ul style="list-style-type: none"> Both refrigerants and insulation materials shall be specified to be non-ozone depleting in both composition and manufacture. 	<ul style="list-style-type: none"> Zero ozone depleting materials used in both composition and manufacture. 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder
Product Choice	<ul style="list-style-type: none"> Paints, flooring and adhesives will be low VOC to Green Star standards and joinery shall be low formaldehyde 	<ul style="list-style-type: none"> Meet credit criteria in Green Star Multi-Residential Version 1 VOC tables for paints, flooring and adhesives. Meet 1 point for low formaldehyde in joinery as per Green Star Multi-Residential Version 1 	<ul style="list-style-type: none"> Design phase: Architect Construction phase: Builder, carpet supplier, all trades working with adhesives internally

4.6 Transport

Bicycle racks on other parts of the site to be used by staff. Refer to Appendix D for Green Travel Plan.



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4.7 Waste Management

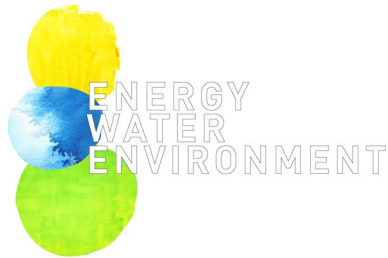
Table 8 : Waste Management Sub-Categories and Initiatives

Waste Management Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Construction Environmental Management Plan	<ul style="list-style-type: none"> A construction environmental management plan will be required to be implemented by the lead contractor. 	<ul style="list-style-type: none"> Production and implementation of an EMP. 	<ul style="list-style-type: none"> Architectural preliminaries to require a CEMP Lead contractor responsibility
Waste Management Plan	<ul style="list-style-type: none"> Construction phase environmental management plan to be implemented. 	<ul style="list-style-type: none"> Minimum 80% of construction waste to be reused or recycled. BESS benchmarking (refer Appendix B.1) 	<ul style="list-style-type: none"> Architectural preliminaries to require a WMP Lead contractor responsibility

4.8 Urban Ecology

Table 9 : Urban Ecology Sub-Categories and Initiatives

Urban Ecology Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Reuse of already developed land	<ul style="list-style-type: none"> The site has previously been developed. 	<ul style="list-style-type: none"> Develop on previously developed site. 	<ul style="list-style-type: none"> Inherent property of the site
Landscaped Areas	<ul style="list-style-type: none"> Landscaping will be provided as shown in Landscape drawings. 	<ul style="list-style-type: none"> To provide landscaping in nominated areas. 	<ul style="list-style-type: none"> Design phase: Architect / Landscape Architect Construction phase: Builder / Landscape Contractor



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4.9 Innovation

There are no initiatives that cannot be categorised within the other 9 categories, therefore the innovation category is not applicable.

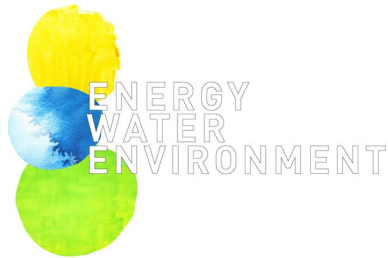
4.10 Construction and Building Management

Table 10 : Construction and Building Management Sub-Categories and Initiatives

Construction and Building Management Sub-Categories	Proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Construction Environmental Management Plan	<ul style="list-style-type: none"> A construction environmental management plan will be required to be implemented by the lead contractor. 	<ul style="list-style-type: none"> Production and implementation of an EMP. 	<ul style="list-style-type: none"> Architectural preliminaries to require a CEMP Lead contractor responsibility
Stormwater Construction Management Plan	<ul style="list-style-type: none"> A stormwater construction management plan will be implemented as part of the construction environmental management plan. 	<ul style="list-style-type: none"> Council requirements. 	<ul style="list-style-type: none"> Architectural preliminaries to require a SMP Lead contractor responsibility
Building User Guide	<ul style="list-style-type: none"> A building user guide to be handed over to all owners after construction. 	<ul style="list-style-type: none"> Sustainability and maintenance information to be included in building user guide. 	<ul style="list-style-type: none"> Lead contractor responsibility

5. Conclusion

The ESD components for the Catherine McAuley College – Joint Use Development and Regional Cricket Hub development have been proposed with reference to current construction code standards, the industry benchmarking tool BESS and Greater Bendigo City Council Planning Scheme ESD requirements. At the planning stage, the proposed design meets best practice as set out by these items.



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Appendix A –NCC Part J Assessment

National Construction Code 2016 Part J – Non-Residential JV3 Report

Introduction – JV3 Report

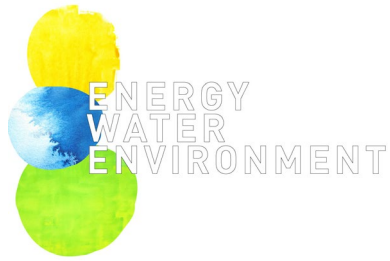
The purpose of this component of the SMP is to show compliance of the proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub design with the energy efficiency requirements of the National Construction Code 2016 and for BESS. This report is town planning purposes only and shows, based on the documentation used in the calculation and associated assumptions, the proposed Catherine McAuley College – Joint Use Development and Regional Cricket Hub design complies with the requirements and will meet a 26% improvement on heating and cooling based on the assumptions made in this section of the SMP. The overall JV3 assessment shows an improvement of 28%.

The proposed building fabric requirements (assumptions) are shown in the table below.

Table 11 : Proposed Building Fabric Requirements

Element of Model	Proposed Model – Design Requirements
Walls	Lightweight cladding, insulation level of entire wall construction R2.8
Roof	Metal roof sheeting. Insulation of entire roof construction R4.0
External Glazing	Aluminium Framed Windows U-Value 6.0, SHGC 0.56 and VLT of minimum 0.58 to meet daylight requirements.

Compliance has been shown using the verification method JV3. Computer simulation energy modeling has been undertaken using IES Virtual Environment Software Version2018. Three models were created and each yielded an annual energy calculation for the purposes of comparison. The figure below shows the calculation requirements for the JV3 method with regards to the three models that are required to be produced.



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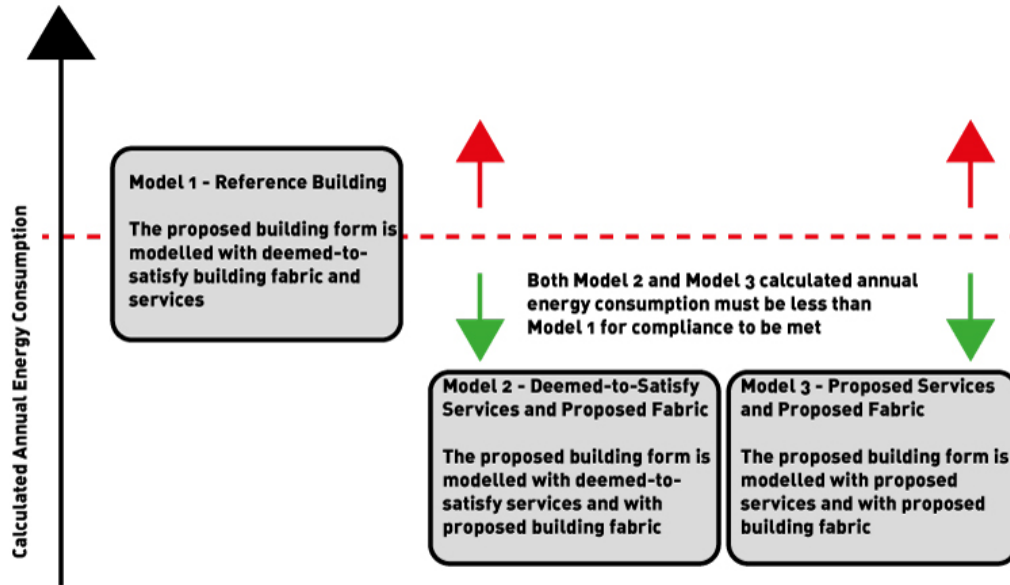
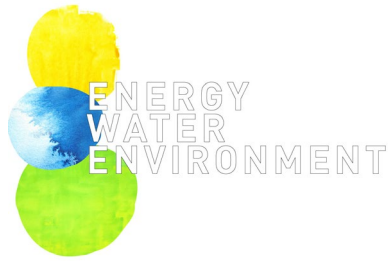


Figure 1 Illustration of the 3 Model Calculation System Required by JV3



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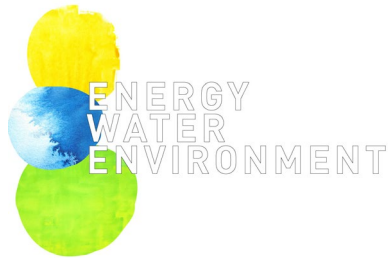
Results JV3 Report

Table 1 below shows the calculated annual energy consumption of the Catherine McAuley College Admin Building for all three models.

Table 12 : Calculated Energy Consumption for 3 Models

Model	Calculated Annual Energy Consumption (MWh / annum)
Model 1 – Deemed-to-Satisfy Building Fabric and Services	142.30 (Reference)
Model 2 – Deemed-to-Satisfy Services and Proposed Building Fabric	139.66 (lower than reference)
Model 3 – Proposed Services and Proposed Building Fabric	102.53 (lower than reference)

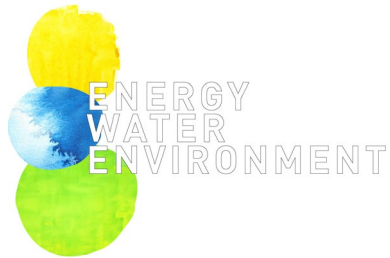
As Model 2 and Model 3 have a lower energy consumption than Model 1, the design is compliant with the National Construction Code energy efficiency requirements.



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Modelling Inputs – JV3 Report

Element of Model	Deemed to Satisfy Model (Not for Construction)	Proposed Model – Minimum Design Requirements
Walls	Lightweight cladding as detailed in Clarke Hopkins Clarke planning documentation. Insulation level of entire wall construction R2.8	Lightweight cladding as detailed in Clarke Hopkins Clarke architectural documentation. Insulation level of entire wall construction R2.8
Floor	Concrete slab on ground	Concrete slab on ground
Roof	Metal roof sheeting. Insulation of entire roof construction R3.2	Metal roof sheeting. Insulation of entire roof construction R4.0
External Glazing	Deemed-to-satisfy external glazing calculator	Aluminium Framed Windows U-Value 6.0 SHGC 0.56 and VLT of minimum 0.58 to meet daylight requirements.
Ceilings	Ceiling tiles	As per deemed-to-satisfy model
Internal Partitions	Plasterboard as detailed in Clarke Hopkins Clarke documentation	As per deemed-to-satisfy model
Artificial Lighting	Illumination power densities and usage profile as per deemed-to-satisfy requirements of Part J6 and Specification JV respectively	Design illumination power densities shall be at least 20% lower than NCC requirements
HVAC System	A split system for heating and cooling to nominated spaces. The COP for cooling is 2.8. Temperature setpoint is 18-26 degrees Celsius for heating and cooling respectively Air flow rate as required by Part F4	A split system for heating and cooling to nominated spaces. The COP for cooling shall be minimum 3.2. Temperature setpoint is 18-26 degrees Celsius for heating and cooling respectively Air flow rate as required by Part F4
HVAC Operation	HVAC usage profile as per Specification JV	As per deemed-to-satisfy model
Location and Weather File	Melbourne 1971 TRY weather file	As per deemed-to-satisfy model
Domestic Hot Water	Not required for this calculation	
Lift Energy	Not applicable	
Infiltration Rate	Pressurised areas have an infiltration rate of 1 air change per hour, non-pressurised areas have an infiltration rate of 1.5 air changes per hour	As per deemed-to-satisfy model
Occupancy	Occupancy heat gains are 75W/person for sensible heat gain and 55W/person for latent heat gain	As per deemed-to-satisfy model
Appliances	Appliance heat gains and usage profile as per Specification JV	As per deemed-to-satisfy model
Information	Information is based on planning package supplied to Energy Water and Environment by Clarke Hopkins Clarke	As per deemed-to-satisfy model



Date: 4/12/2019
Project Number: PJ460
Project Title: Catherine McAuley College – Joint Use
Development and Regional Cricket Hub
Document Title: Sustainable Management Plan Final Version 2

Appendix B – BESS and MUSIC Calculations

B.1 BESS Assessment

The full BESS assessment is attached on the overleaf.

This BESS report outlines the sustainable design commitments of the proposed development at 1 St Vincents Road Bendigo Bendigo VIC 3550. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Greater Bendigo City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

1 St Vincents Road Bendigo, Bendigo 3550 Bendigo

Site area: 6199 m² ·
 Site type: Non-residential development m² ·
 Building Floor Area: 5500 m² ·
 Date of Assessment: 04 Dec 2019 ·
 Version: V4, 1.6.0-B.253 ·
 Applicant: patrick@ewenvironment.com.au

Project Identifier

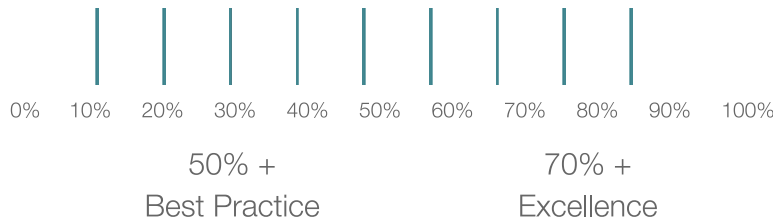
3910E9FD

Published

<http://bess.net.au/projects/3910E9FD-V1>

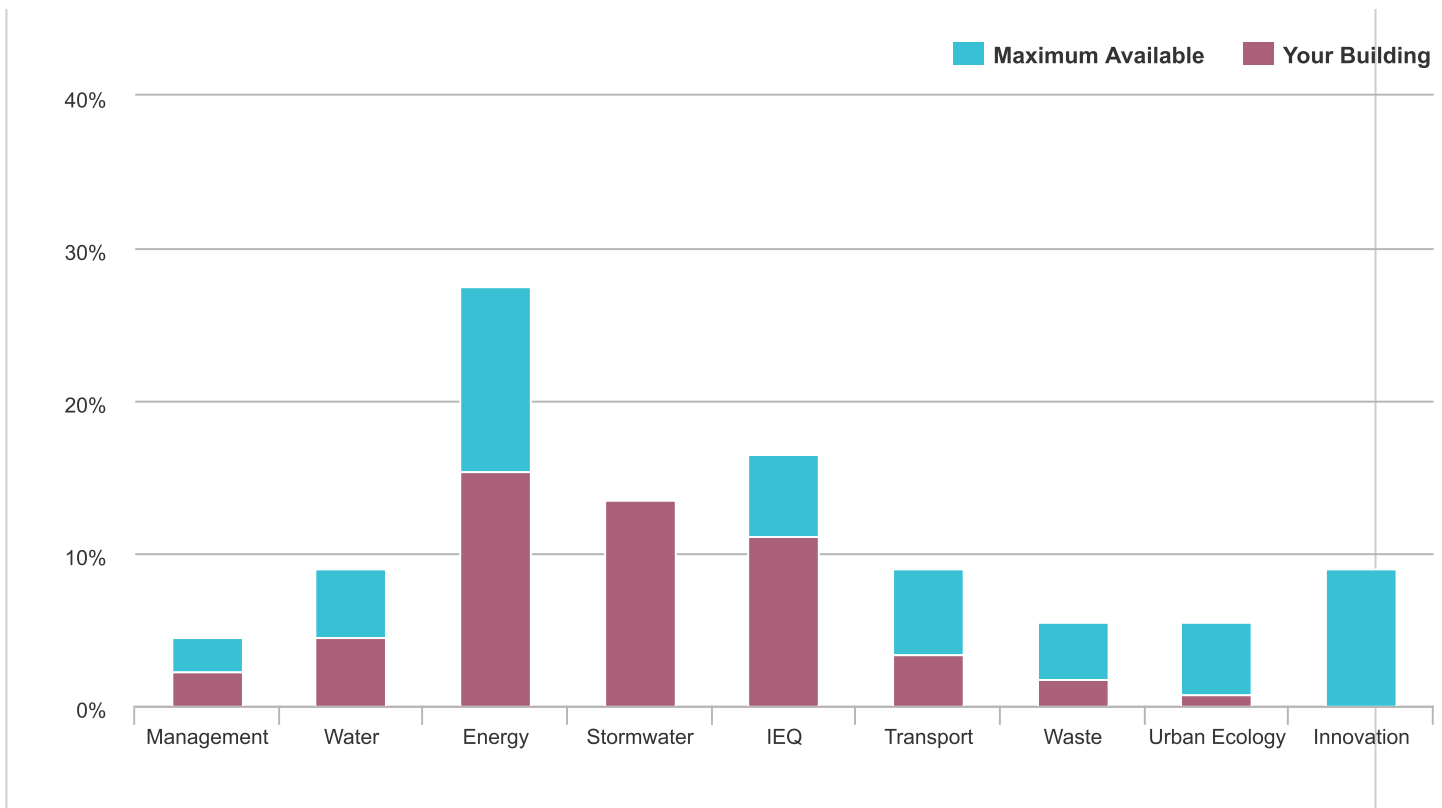
Your BESS score is

+ 52%



% of Total	Category	Score	Pass
2 %	Management	50 %	
4 %	Water	50 %	✓
15 %	Energy	56 %	✓
14 %	Stormwater	100 %	✓
11 %	IEQ	67 %	✓
3 %	Transport	38 %	
2 %	Waste	33 %	
1 %	Urban Ecology	12 %	
0 %	Innovation	0 %	

How did this Development Perform in each Environmental Category?



Sustainable design commitments by category

The sustainable design commitments for this project are listed below. These are to be incorporated into the design documentation and subsequently implemented.

Management

50% - contributing 2% to overall score

Credit	Disabled	Scoped out	Score
Management 2.3 Thermal Performance Modelling - Non-Residential			100 %
Management 3.3 Metering			100 %
Management 4.1 Building Users Guide			100 %

Management 2.3 Thermal Performance Modelling - Non-Residential 100%

Score Contribution This credit contributes 25.0% towards this section's score.

Aim To encourage and recognise developments that have used modelling to inform passive design at the early design stage

Questions

Has preliminary modelling been undertaken in accordance with either BCA Section J (Energy Efficiency), NABERS or Green Star?

Yes

Management 3.3 Metering

100%

Score Contribution

This credit contributes 12.5% towards this section's score.

Aim

To provide building users with information that allows monitoring of energy and water consumption

Questions

Have all major common area services been separately submetered?

Yes

Management 4.1 Building Users Guide

100%

Score Contribution

This credit contributes 12.5% towards this section's score.

Aim

To encourage and recognise initiatives that will help building users to use the building efficiently

Questions

Will a building users guide be produced and issued to occupants?

Yes

Water

50% - contributing 4% to overall score

Credit

Disabled Scoped out Score

Water 1.1 Potable water use reduction

40 %

Water 3.1 Water Efficient Landscaping

100 %

Water 4.1 Building Systems Water Use Reduction

N/A

Water Approachs

What approach do you want to use Water?

Use the built in calculation tools

Are you installing a rainwater tank?

Yes

Water fixtures, fittings and connections

Joint Use Development

Showerhead

3 Star WELS (≥ 6.0 but ≤ 7.5)

Bath

Scope out

Kitchen Taps

 ≥ 5 Star WELS rating

Bathroom Taps

 ≥ 6 Star WELS rating

Dishwashers

 ≥ 5 Star WELS rating

WC

 ≥ 4 Star WELS rating

Urinals

 ≥ 6 Star WELS rating

Washing Machine Water Efficiency

Scope out

Non-potable water source connected to Toilets

Yes

Rainwater Tanks

Tank 1

What is the total roof area connected to the rainwater tank?

Square Metres

2000.0

Tank Size

Litres

10000.0

Irrigation area connected to tank

Square Metres

2.0

Is connected Irrigation area a water efficient garden?

Yes

Water 1.1 Potable water use reduction

40%

Score Contribution

This credit contributes 83.3% towards this section's score.

Aim

Water 1.1 Potable water use reduction (interior uses) What is the reduction in total water use due to efficient fixtures, appliances, and rainwater use?

To achieve points in this credit there must be $>25\%$ potable water reduction. You are using the built in calculation tools. This credit is calculated from information you have entered above.

Criteria

What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.

Questions

Percentage Achieved ? Percentage %

%

Calculations

Reference (kL)

9481

Proposed (excluding rainwater and recycled water use) (kL)

6965

Rainwater or recycled water supplied (Internal + External) (kL)

522

Proposed (including rainwater and recycled water use) (kL)

6442

% Reduction in Potable Water Consumption Percentage %

32 %

Water 3.1 Water Efficient Landscaping

100%

Score Contribution

This credit contributes 16.7% towards this section's score.

Aim

Are water efficiency principles used for landscaped areas? This includes low water use plant selection (e.g. xeriscaping) and specifying water efficient irrigation (e.g. drip irrigation with timers and rain sensors). Note: food producing landscape areas and irrigation areas connected to rainwater or an alternative water source are excluded from this section.

Questions

Will water efficient landscaping be installed?

Yes

Water 4.1 Building Systems Water Use Reduction

N/A

This credit was scoped out: Not applicable

Aim	Will the project minimise water use for building systems such as evaporative cooling and fire testing systems?
------------	--

Energy

56% - contributing 15% to overall score

Credit	Disabled	Scoped out	Score
Energy 1.1 Thermal Performance Rating - Non-Residential			38 %
Energy 2.1 Greenhouse Gas Emissions			100 %
Energy 2.3 Electricity Consumption			100 %
Energy 2.4 Gas Consumption			N/A
Energy 3.1 Carpark Ventilation			N/A
Energy 3.2 Hot Water			100 %
Energy 3.7 Internal Lighting - Non-Residential			100 %
Energy 4.1 Combined Heat and Power (cogeneration / trigeneration)			N/A

Energy 1.1 Thermal Performance Rating - Non-Residential	38%
---	-----

Score Contribution	This credit contributes 44.4% towards this section's score.
---------------------------	---

Aim	Reduce reliance on mechanical systems to achieve thermal comfort in summer and winter - improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.
------------	--

Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2016 BCA Volume 1 Section J)
-----------------	--

Questions

Criteria Achieved ?

-

Calculations

Total Improvement Percentage %

25 %

Energy 2.1 Greenhouse Gas Emissions

100%

Score Contribution This credit contributes 11.1% towards this section's score.

Aim Reduce the building's greenhouse gas emissions

Criteria Are greenhouse gas emissions >10% below the benchmark

Questions

Criteria Achieved ?

-

Calculations

Reference Building with Reference Services (BCA only) kg CO₂

117165.0

Proposed Building with Proposed Services (Actual Building) kg CO₂

80997.9

% Reduction in GHG Emissions Percentage %

30 %

Energy 2.3 Electricity Consumption

100%

Score Contribution This credit contributes 11.1% towards this section's score.

Aim Reduce consumption of electricity

Criteria Is the annual electricity consumption >10% below the benchmark

Questions

Criteria Achieved ?

-

Calculations

Reference kWh

109500.0

Proposed kWh

75699.0

Improvement Percentage %

30 %

Energy 2.4 Gas Consumption

N/A

This credit was scoped out: No gas supply in use.

This credit was disabled: No gas supply in use.

Aim	Reduce consumption of electricity
------------	-----------------------------------

Criteria	Is the annual gas consumption >10% below the benchmark?
-----------------	---

Energy 3.1 Carpark Ventilation

N/A

This credit was scoped out: No basement car park

Energy 3.2 Hot Water

100%

Score Contribution	This credit contributes 5.6% towards this section's score.
---------------------------	--

Criteria	Does the hot water system use >10% less energy (gas and electricity) than the reference case?
-----------------	---

Questions

Criteria Achieved ?

-

Calculations

Reference kWh

33200.0

Proposed kWh

19166.0

Improvement Percentage %

42 %

Energy 3.7 Internal Lighting - Non-Residential 100%

Score Contribution This credit contributes 11.1% towards this section's score.

Aim Reduce energy consumption associated with internal lighting

Questions

Is the maximum illumination power density (W/m²) in at least 90% of the relevant building class at least 20% lower than required by Table J6.2a of the NCC 2016 BCA Volume 1 Section J (Class 2 to 9)

Yes

Energy 4.1 Combined Heat and Power (cogeneration / trigeneration) N/A

This credit was scoped out: No cogeneration or trigeneration system in use.

This credit was disabled: No cogeneration or trigeneration system in use.

Aim Reduce energy consumption

Criteria Does the CHP system reduce the class of buildings GHG emissions by more than 25%?

Stormwater 100% - contributing 14% to overall score

Credit	Disabled	Scoped out	Score
Stormwater 1.1 Stormwater Treatment			100 %

Which stormwater modelling are you using?

Melbourne Water STORM tool

Stormwater 1.1 Stormwater Treatment

100%

Score Contribution	This credit contributes 100.0% towards this section's score.
Aim	To achieve best practice stormwater quality objectives through reduction of pollutant load (suspended solids, nitrogen and phosphorus)
Criteria	Has best practice stormwater management been demonstrated?

Questions

STORM score achieved

100

Flow (ML/year) % Reduction

-

Total Suspended Solids (kg/year) % Reduction

-

Total Phosphorus (kg/year) % Reduction

-

Total Nitrogen (kg/year) % Reduction

-

Calculations

Min STORM Score

100

IEQ

67% - contributing 11% to overall score

Credit	Disabled	Scoped out	Score
IEQ 1.4 Daylight Access - Non-Residential			67 %

IEQ 1.4 Daylight Access - Non-Residential

67%

Score Contribution	This credit contributes 100.0% towards this section's score.
Aim	To provide a high level of amenity and energy efficiency through design for natural light.
Criteria	What % of the nominated floor area has at least 2% daylight factor?

Questions

% Achieved ?

70 %

Transport

38% - contributing 3% to overall score

Credit	Disabled	Scoped out	Score
Transport 1.4 Bicycle Parking - Non-Residential			100 %
Transport 1.5 Bicycle Parking - Non-Residential Visitor			100 %

Transport 1.4 Bicycle Parking - Non-Residential 100%

Score Contribution	This credit contributes 25.0% towards this section's score.
Aim	To encourage and recognise initiatives that facilitate cycling
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?

Questions

Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?

Yes

Bicycle Spaces Provided ?

-

Transport 1.5 Bicycle Parking - Non-Residential Visitor

100%

Score Contribution	This credit contributes 12.5% towards this section's score.
---------------------------	---

Aim	To encourage and recognise initiatives that facilitate cycling
------------	--

Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?
-----------------	--

Questions

Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?

Yes

Bicycle Spaces Provided ?

-

Waste

33% - contributing 2% to overall score

Credit	Disabled	Scoped out	Score
Waste 2.2 - Operational Waste - Convenience of Recycling			100 %

Waste 2.2 - Operational Waste - Convenience of Recycling			100%
--	--	--	------

Score Contribution	This credit contributes 33.3% towards this section's score.
---------------------------	---

Aim	To minimise recyclable material going to landfill
------------	---

Questions

Are the recycling facilities at least as convenient for occupants as facilities for general waste?

Yes

Urban Ecology

12% - contributing 1% to overall score

Credit	Disabled	Scoped out	Score
Urban Ecology 1.1 Communal Spaces			100 %

Urban Ecology 1.1 Communal Spaces 100%

Score Contribution This credit contributes 12.5% towards this section's score.

Aim To encourage and recognise initiatives that facilitate interaction between building occupants

Criteria Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251

Questions

Common space provided Square Metres

500.0

Calculations

Minimum Common Space Required Square Metres

206

Innovation

0% - contributing 0% to overall score

Items to be marked on floorplans

Do not upload your floorplans and elevations into the BESS tool. Instead, please ensure the items below are marked on the plans and provide a document / page reference number in the comments field.

Urban Ecology 1.1: Size and location of communal spaces To be printed

Floorplans & elevations - Refer to architectural documents

Waste 2.2: Location of recycling facilities To be printed

Floorplans & elevations - Refer to architectural and site documents

Transport 1.4: All nominated non-residential bicycle parking spaces To be printed

Floorplans & elevations - Bicycle racks on other parts of the site to be used by staff.

Transport 1.5: All nominated non-residential visitor bicycle parking spaces To be printed

Floorplans & elevations - Bicycle racks on other parts of the site to be used by staff.

Stormwater 1.1: Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips) To be printed

Floorplans & elevations - Refer to stormwater management strategy

Water 3.1: Water efficient garden annotated To be printed

Floorplans & elevations - Refer to landscape plans

Management 3.3: Common area submeters annotated To be printed

Floorplans & elevations - Refer to services plans

Documents and evidence

Based on the information you have entered, the following supporting evidence is required. You can choose to upload supporting documents directly to BESS, or submit a printed version as an appendix to your BESS report. Use the comments field to provide a reference (e.g. page number) if relevant.

IEQ 1.4: A short report detailing assumptions used and results achieved. Refer to SMP - Refer to SMP	To be printed
---	---------------

Stormwater 1.1: STORM report or MUSIC model Refer to SMP - Refer to SMP	To be printed
--	---------------

Energy 1.1: Energy Report showing calculations of reference case and proposed buildings Refer to SMP - Refer to SMP	To be printed
--	---------------

Energy 3.7: Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used. Refer to SMP - Refer to SMP	To be printed
--	---------------

Management 2.3: Preliminary modelling report Refer to SMP - Refer to SMP	To be printed
---	---------------

Other Supporting Documents

Please upload any other documents here that may help to support your application.

Management Section

[Add Supporting Document](#)

Water Section

[Add Supporting Document](#)

Energy Section

[Add Supporting Document](#)

Stormwater Section

[Add Supporting Document](#)

IEQ Section

[Add Supporting Document](#)

Transport Section

[Add Supporting Document](#)

Waste Section

[Add Supporting Document](#)

Urban Ecology Section

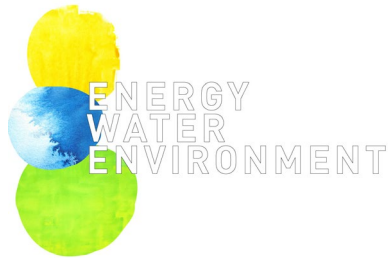
[Add Supporting Document](#)

Innovation Section

[Add Supporting Document](#)

The Built Environment Sustainability Scorecard (BESS) has been provided for the purpose of information and communication. While we make every effort to ensure that material is accurate and up to date (except where denoted as 'archival'), this material does in no way constitute the provision of professional or specific advice. You should seek appropriate, independent, professional advice before acting on any of the areas covered by BESS.

The Municipal Association of Victoria (MAV) and CASBE (Council Alliance for a Sustainable Built Environment) member councils do not guarantee, and accept no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of BESS, any material contained on this website or any linked sites.

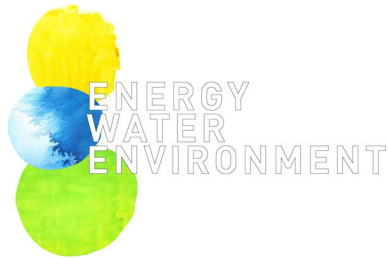


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B.2 Excerpt of MUSIC Results

Excerpt of MUSIC results from the Stormwater Management Plan. These results have been input into the BESS Tool.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	42.6	37.3	12.6
Total Suspended Solids (kg/yr)	8990	747	91.7
Total Phosphorus (kg/yr)	17.6	4.86	72.4
Total Nitrogen (kg/yr)	119	54.3	54.4
Gross Pollutants (kg/yr)	1550	0	100



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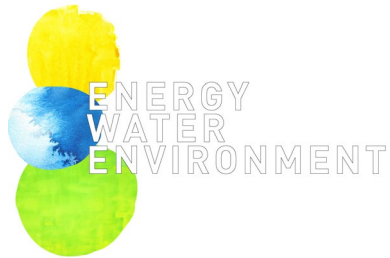
Appendix C – Daylight Assessment

A daylight assessment has been carried out for the Catherine McAuley College – Joint Use Development and Regional Cricket Hub using the IES VE Software.

The analysis showed that for the primary usable spaces the percentage of area achieving a daylight factor of 2% or above was 70% of area.

The assumptions made for the daylight analysis are shown in the following table.

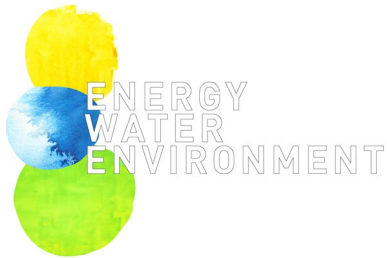
Element	Description
Weather file	ACADS-BSG/CSIRO Melbourne Regional Office Test Reference Year
Sky	Uniform Design Sky
Software	Integrated Environmental Solutions – Virtual Environment 2018 with Radiance Toolkit
Working Plane	Daylight factors taken at floor level
Floor / Roof Reflectance	0.3
Wall Reflectance	0.7
Ceiling Reflectance	0.8
Ground Reflectance	0.2
External Wall Reflectance	0.5 (Medium paint colour)
External Glazing VLT	Single glazing with VLT 58% Note- this is similar to the glass selected to meet the energy efficiency requirements for these spaces
Internal glazing VLT	Not Applicable



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Appendix D – Green Travel Plan

See attached for Green Travel Plan



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Project Number: PJ460
Project Title: Catherine McAuley College – Joint Use
Development and Regional Cricket Hub
Document Title: Green Travel Plan V2 Final

Green Travel Plan V2 Final

Prepared by Energy Water and Environment Consulting 4/12/2019

1) Introduction

This Green Travel Plan is intended for Catherine McAuley College – Coolock Campus.

The Plan has been prepared with reference to the Green Star Design and As-Built Sustainable Transport (Credit 17) credit and will inform the future design from acceptance at the planning phase.

2) Aims and Objectives

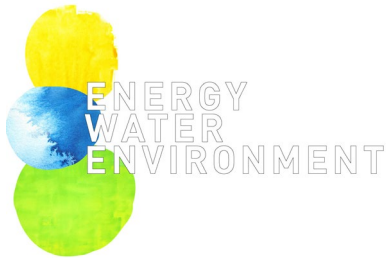
The underlying objective of this Travel Plan is to reduce carbon emissions from travel and traffic congestion, to improve building occupant health, well-being and travel independence through sustainable travel options such as walking, cycling, public transport and car-pooling.

The chief objective of the Green Travel Plan is to provide details of the design initiatives and sustainable management practices for encouraging and enabling building occupants to reduce dependence on car usage. More specifically it will:

- Identify measurable and realistic annual targets for reducing dependency on car usage (against the baseline)
- Facilitate a strong commitment to the GTP by the design team and The School by identifying a list of actions and key responsibilities for design, construction and post-handover stage
- Provide information on the education and awareness programs available to empower residents to change their travel habits
- Outline a monitoring plan to measure the success and uptake of the Plan

3) Targets

- Achieve 15% reduction on car based commutes by one year after handover
- Achieve 30% increase (compared to the baseline) in sustainable travel uptake by building occupants and users by one year after handover



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4) Actions and Chart of Responsibilities

A list of design/management actions have been listed below to support alternative Sustainable Travel:

a. Undertake Survey of building occupants’ travel habits

An access audit should be undertaken to provide the following information, which will form the basis for the Green Travel Plan:

- A brief description of the survey process
- Define a baseline for the development
- Outline the key findings – e.g. commute trips for each transport mode (public transport, cyclic paths, walking, car-pool), most common reasons for travel choices
- Outline a list of barriers and opportunities for sustainable travel
- Provide a graph or chart of the key results

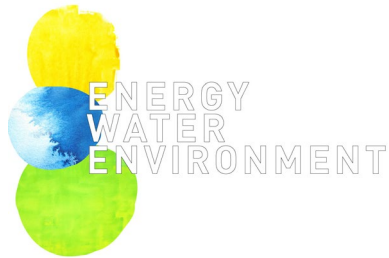
b. Undertake Accessibility assessment

The School has undertaken an Accessibility Assessment to see how accessible the development is for all different modes of transport and the design caters for the following where practicable:

- Site accessibility for pedestrians and cyclists
- Cycle access
- Public Transport Accessibility
- Access to bus/train services including shuttle buses
- Bus stop facilities

c. Actions for encouraging and enabling walking as a travel option

Action	Timeline	By whom
Produce a map showing safe walking routes to and from the site with times, not distances, to local facilities, such as shops and bus stops (e.g. Walkscore)	Design and Handover	School
Open-up short cuts for pedestrian access across/along the proposed work site	Design	Lead Contractor
Ensure pedestrian safety and access is not compromised during construction or by cross sections	Design	Lead Contractor



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d. Actions for encouraging and enabling Cycling as a travel option

Action	Timeline	By whom
Provide sufficient number of secure bicycle parking spaces, which is easily accessible, well lit and secure.	Design	Architect / School / Lead Contractor
Provide cycle parking for visitors.	Design	Architect / School / Lead Contractor
Ensure bike parking is easily accessible and clearly visible or provide signage to direct people to bike parking spaces.	Design/ Construction	Architect / School / Lead Contractor
Review condition and interconnection opportunities of existing onsite cycle routes	Design/ Construction	Architect / School /
Upgrade or provide new onsite cycle routes	Design/ Construction	Architect / School /
Ensure cycle routes are not compromised during construction or by cross sections	Construction	Lead Contractor

e. Actions for encouraging and enabling Public Transport as a travel option

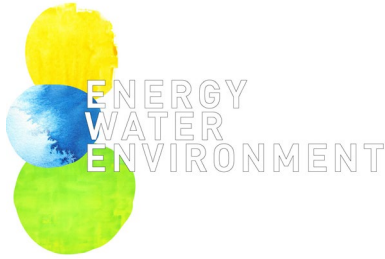
Action	Timeline	By whom
A map showing public transport routes to the site	Post Handover	School

f. Actions for encouraging and enabling Car Pooling as a travel option

Action	Timeline	By whom
Allocate priority parking spaces for car poolers	Design/ Construction	Architect / School / Lead Contractor

g. Actions for proper designation of Car Parking

Action	Timeline	By whom
Identify priority users of car park e.g. people with disabilities	Design/ Construction	Architect / School / Lead Contractor
Provide spaces for car-share	Design/ Construction	Architect / School / Lead Contractor
Provide spaces for mopeds/motorbikes	Design/	Architect /



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	Construction	School / Lead Contractor
--	--------------	--------------------------

h. Management practices identifying sustainable transport initiatives

Action	Timeline	By whom
- Commitment to conducting an Access survey to set baseline and gain insights about the travel habits of the building occupants - Commitment to implementing this Green Travel Plan	Post-handover	School

5) Details of Education and Awareness Program

A program of information and awareness will be developed to facilitate, support and empower building occupants to change their travel habits. This may include the following:

- Creating a central source of information for:
 - o Online maps of walking paths, cycle routes and cycle parking spots
 - o A list of facilities and design features in place that support the uptake of alternative travel plans
 - o Facilitation of ‘buddying-up’ for cycling, car-pooling and walking
 - o Facilitation of interaction between building occupants on Sustainable Travel options
 - o Provide links to informative websites, information about local community groups and programs and annual events etc.
 - o Potentially arrange group discounts on travel cards
 - o Supply and manage a building toolkit - this can consist of puncture repair equipment, a bike pump, a spare lock and lights
 - o Participate in annual events such as 'Ride to Work Day'
 - o Set up and manage databases and portals e.g. car pooling database

6) Monitoring & Reporting Plan

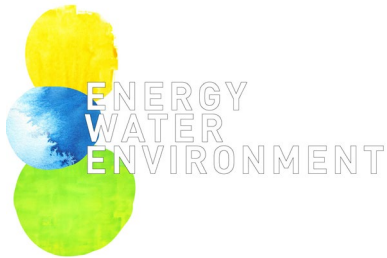
Monitoring is an essential part of the Green Travel Plan and shall be undertaken by the School.

The following method/tools may be used to monitor the Travel Plan:

- Annual questionnaires for the building occupants
- Random on-site vehicle counts during the work-hours
- Periodical accessibility assessment to assess how accessible the development is for all different modes of transport

The monitoring reporting may also include the following:

- An assessment of travel questionnaire results and any other monitoring such as vehicle counts.
- An assessment of how the targets are being met
- Any revisions to the Travel Plan (e.g. new list of actions)



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7) Useful Links and Resources

Bicycle Network

<https://www.bicyclenetwork.com.au>

Public Transport Victoria

<http://ptv.vic.gov.au>

TravelSmart

<http://www.travelsmart.gov.au>