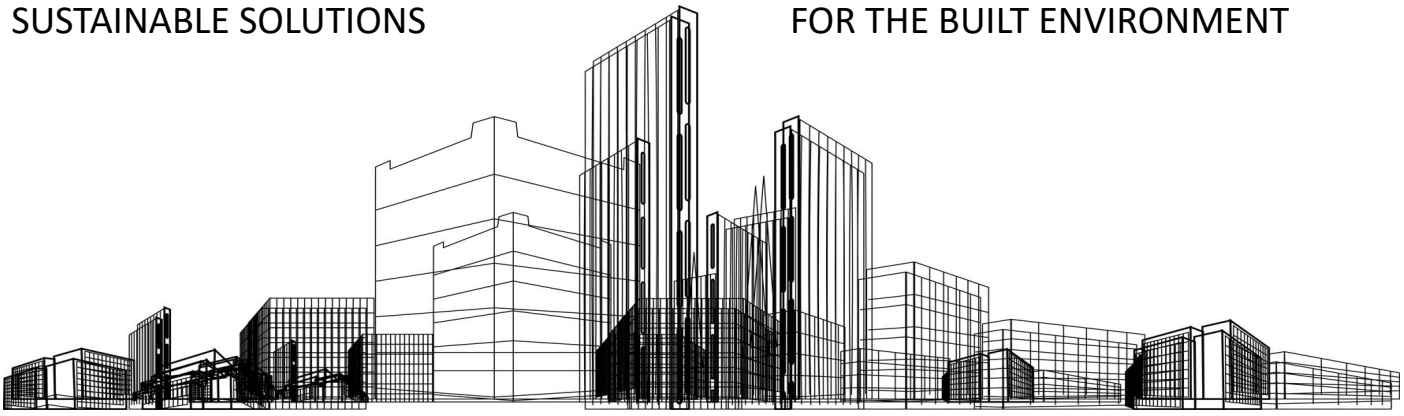
ENERGY
WATER
ENVIRONMENT

LOYOLA COLLEGE - STEM BUILDING

SUSTAINABILITY MANAGEMENT PLAN V2

19TH APRIL, 2023

SUSTAINABLE SOLUTIONS FOR THE BUILT ENVIRONMENT



Date:	19/04/23
Project Number:	PJ587
Project Title:	Loyola College – STEM Building
To:	Tina Huynh (Clarke Hopkins Clarke) Banyule City Council
From:	Patrick Phelan

Document Title: Sustainability Management Plan Version 2

Table of Contents

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1. Executive Summary

The purpose of this Sustainability Management Plan (SMP) is to show the sustainable design initiatives proposed for the Loyola College STEM Building at the planning stage. The school is located on Grimshaw Street, Watsonia. It is subject to the ESD requirements of Banyule City Council. At the planning stage, the proposed development has been assessed against Banyule 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 Loyola College STEM Building

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	✓	Banyule City Council planning scheme	Refer to Section 4.4 and Appendix B.2.
BESS sustainability tool assessment	✓	Banyule City Council planning scheme	Refer to Section 3.3 and Appendix B
An SMP describing sustainable initiatives for the development, targets and implementation	✓	Banyule City Council planning scheme.	Refer to Section 4

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

Where operational practices are required they will be carried out by the management of the Loyola College STEM Building.

2. Introduction

The purpose of this Sustainability Management Plan (SMP) is to show the sustainable design initiatives proposed for the Loyola College STEM Building at the planning stage. The school is located on Grimshaw Street, Watsonia. It is subject to the ESD requirements of Banyule City Council. At the planning stage, the proposed development has been assessed against Banyule City Council Planning Scheme requirements and the National Construction Code energy efficiency regulations.

3. Performance Requirements

3.1 National Construction Code 2019 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 Loyola College STEM Building 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 Loyola College STEM Building Design

BESS, Loyola College STEM Building Loyola College, Watsonia 3087

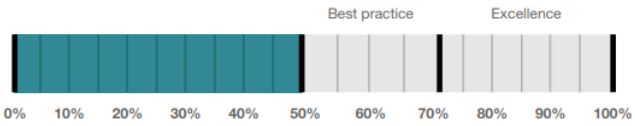
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at Loyola College Watsonia Victoria 3087. 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 Banyule 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.

Your BESS Score



50%

Project details

Address	Loyola College Watsonia Victoria 3087
Project no	3731C97D-R3
BESS Version	BESS-6
Site type	Non-residential development
Account	patrick@ewenvironment.com.au
Application no.	
Site area	4,200.00 m²
Building floor area	2,260.00 m²
Date	19 April 2023
Software version	1.7.1-B.396

Performance by category ● Your development ○ Maximum available

Category	Weight	Score	Pass
Management	5%	37%	
Water	9%	50%	✓
Energy	28%	66%	✓
Stormwater	14%	100%	✓
IEQ	17%	56%	✓
Transport	9%	0%	
Waste	6%	50%	
Urban Ecology	6%	12%	
Innovation	9%	0%	

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

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4. ESD Initiatives

The following sections outline the ESD initiatives and management processes that are proposed for the Loyola College STEM Building 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 Sustainability Management Plan are the responsibility of the design team, Loyola College and the lead and sub-contractors.

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

4.1 Indoor Environment Quality (IEQ)

Table 3 : IEQ Sub-Categories and Initiatives

IEQ Sub-Categories	Proposed Loyola College STEM Building Initiatives	Performance Target	Schedule of Initiatives and Responsibility
Daylight	▪ Habitable spaces achieve 78% of area coverage over daylight factor of 2%	▪ BESS benchmarking Refer to Appendix C for daylight calculations	▪ Design phase: Architect ▪ Construction phase: Builder, window contractor
Hazardous Materials	▪ No hazardous waste shall be used in construction materials	▪ No hazardous waste shall be used in construction materials	▪ Implemented as part of construction of design drawings (mechanical contractor responsibility)
Acoustics	▪ All mechanical equipment shall meet the Australian Standards for noise levels	▪ To meet Australian Standards for noise levels	▪ Design phase: Architect ▪ Construction phase: Builder
Ventilation	▪ CO2 monitoring to 800ppm and 50% improvement on outside air on AS1668 levels shall be provided	▪ CO2 monitoring to 800ppm and 50% improvement on outside air on AS1668 levels	▪ Design phase: Architect ▪ Construction phase: Builder
Low VOC and Low Formaldehyde	▪ Low VOC paints, carpets, adhesives and sealants and Low Formaldehyde Composite Wood Products	▪ Low VOC paints and Low Formaldehyde Composite Wood Products	▪ Design phase: Architect ▪ Construction phase: Builder

4.2 Energy Efficiency

Table 4 : Energy Efficiency Sub-Categories and Initiatives

Energy Efficiency Sub-Categories	Proposed Loyola College STEM Building Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Operating Energy and Building Fabric	▪ JV3 assessment shows an improvement of over 10% of NCC Part J benchmarks	▪ 10% improvement on NCC Part J	▪ Design phase: Architect ▪ Construction phase: Builder
Heating and Cooling	▪ Cooling shall be provided via VRF systems to all habitable spaces. The nominated minimum EER and COP for the systems is 3.2 (noting that most units will be higher)	▪ COP of 3.2 (noting that most units will be higher)	▪ Design phase: Architect, mechanical designer ▪ Construction phase: Builder, mechanical contractor
Lighting Power Density	▪ 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	▪ National Construction Code requirements. ▪ BESS benchmarking (refer Appendix B.1)	▪ Design phase: Architect, Electrical Designer ▪ Construction phase: Electrical Contractor
Domestic Hot Water	▪ Domestic hot water shall be electric storage units noting that hot water usage for STEM building is minimal	▪ BESS benchmarking (refer Appendix B.1)	▪ Design phase: Architect, hydraulic designer ▪ Construction phase: Hydraulic contractor
External Lighting	▪ External lighting will be controlled via a time switch and motion detection	▪ BESS benchmarking (refer Appendix B.1)	▪ Design phase: Architect, Electrical Designer ▪ Construction phase: Electrical Contractor
Solar PV	▪ 15kW solar PV system shall be installed on the Loyola STEM building roof	▪ 15kW solar PV system shall be installed on the Loyola STEM building roof	▪ Design phase: Architect, Electrical Designer ▪ Construction phase: Electrical Contractor

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4.3 Water Efficiency

Table 5 : Water Efficiency Sub-Categories and Initiatives

Water Efficiency Sub-Categories	Proposed Loyola College STEM Building Initiatives	Performance Target	Schedule of Initiatives and Responsibility
Minimising Amenity Water Demand	▪ The fittings and fixtures proposed for the development will meet the following Star Ratings under the Water Efficiency Labeling Scheme: ▪ Toilets – 4 Star ▪ Basin Taps – 6 Star ▪ Kitchen Taps – 5 Star	▪ As per star rating targets specified. ▪ BESS benchmarking (refer Appendix B.1)	▪ Design phase: Architect / Hydraulic Designer ▪ Construction phase: Builder and hydraulic contractor
Rainwater Harvesting	▪ A 10,000 litre rainwater tank will be implemented and will be connected to roof drainage. The water will be used to flush toilets.	▪ Flush all toilets.	▪ Design phase: Architect / Hydraulic Designer ▪ Construction phase: Builder and hydraulic contractor
Heat Rejection Water	▪ Air conditioning units shall use air-cooled condenser components.	▪ No water to be used in cooling.	▪ Design phase: Architect / Mechanical Designer ▪ Construction phase: Builder and Mechanical Contractor

4.4 Stormwater Management

Table 6 : Stormwater Management Sub-Categories and Initiatives

Stormwater Management Sub-Categories	Proposed Loyola College STEM Building Initiatives	Performance Target	Schedule of Initiatives and Responsibility
STORM rating	▪ The calculated STORM rating is 121%. Refer to Appendix B.2 for the STORM report.	▪ A minimum of 100% in STORM.	▪ Design phase: Architect / ESD Consultant / Hydraulic Designer / Civil Designer / Landscape Consultant ▪ Construction phase: Builder, civil contractor, landscape contractor and hydraulic contractor
Discharge to Sewer	▪ Low flow fittings and fixtures shall be used and shall reduce the discharge to sewer.	▪ The fittings and fixtures proposed for the development will meet the following Star Ratings under the Water Efficiency Labeling Scheme: ▪ Toilets – 4 Star ▪ Basin Taps – 6 Star ▪ Kitchen Taps – 5 Star	▪ Implemented as part of construction of design drawings (contractor responsibility)
Watercourse Pollution	▪ Rainwater harvesting is proposed for the proposed building to meet the watercourse pollution requirements of Council. Refer to Appendix B for the STORM report.	▪ A minimum of 100% in STORM.	▪ 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 Loyola College STEM Building Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Storage for Recycling Waste	▪ Appropriate bin storage space including space for recycling bins has been allocated.	▪ Refer to Waste Management Plan for details.	▪ Design phase: Architect ▪ Construction phase: Builder
Environmental Toxicity	▪ Both refrigerants and insulation materials shall be specified to be non-ozone depleting in both composition and manufacture.	▪ Zero ozone depleting materials used in both composition and manufacture.	▪ Design phase: Architect ▪ Construction phase: Builder
Product Choice	▪ Paints, flooring and adhesives will be low VOC to Green Star standards and joinery shall be low formaldehyde	▪ Meet credit criteria in Green Star VOC tables for paints, flooring and adhesives. ▪ Meet 1 point for low formaldehyde in joinery as per Green Star requirements	▪ Design phase: Architect ▪ Construction phase: Builder, carpet supplier, all trades working with adhesives internally
Steel	▪ Rondo steel stud framing – made in Australia. Steel is sourced from Bluescope steel which contains on average 17.4% recycled content ▪ Colorbond steel – made in Australia, sourced from Bluescope steel see recycled content above and is itself 100% recyclable	▪ Use of Bluescope Steel	▪ Design phase: Architect, Structural Consultant ▪ Construction phase: Builder
Insulation	▪ Glasswool (or equivalent product) to be used and made from at least 80% recycled material	▪ Insulation 80% recycled material	▪ Design phase: Architect ▪ Construction phase: Builder
PVC	▪ Best Environmental Practice PVC shall be used for pipework, conduits and cables as defined by the Vinyl Council of Australia.	▪ Best Environmental Practice PVC shall be used for pipework, conduits and cables as defined by the Vinyl Council of Australia.	▪ Design phase: Architect, Mechanical, Electrical, Hydraulic, Civil consultants ▪ Construction phase: Builder, Mechanical, Electrical, Hydraulic, Civil contractors

4.6 Transport

Not applicable for this project.

4.7 Waste Management

Table 8 : Waste Management Sub-Categories and Initiatives

Waste Management Sub-Categories	Proposed Loyola College STEM Building Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Construction Environmental Management Plan	▪ A construction environmental management plan will be required to be implemented by the lead contractor.	▪ Production and implementation of an EMP.	▪ Architectural preliminaries to require a CEMP ▪ Lead contractor responsibility
Waste Management Plan	▪ Construction phase environmental management plan to be implemented.	▪ Minimum 80% of construction waste to be reused or recycled. ▪ BESS benchmarking (refer Appendix B.1)	▪ 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 Loyola College STEM Building Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Reuse of already developed land	▪ The site has previously been developed.	▪ Develop on previously developed site.	▪ Inherent property of the site
Landscaped Areas	▪ Landscaping will be provided as shown in Landscape drawings.	▪ To provide landscaping in nominated areas.	▪ Design phase: Architect / Landscape Architect ▪ Construction phase: Builder / Landscape Contractor

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 Loyola College STEM Building Initiatives	Performance Target and Implementation	Schedule of Initiatives and Responsibility
Construction Environmental Management Plan	▪ A construction environmental management plan will be required to be implemented by the lead contractor.	▪ Production and implementation of an EMP.	▪ Architectural preliminaries to require a CEMP ▪ Lead contractor responsibility
Stormwater Construction Management Plan	▪ A stormwater construction management plan will be implemented as part of the construction environmental management plan.	▪ Council requirements.	▪ Architectural preliminaries to require a SMP ▪ Lead contractor responsibility
Building User Guide	▪ A building user guide to be handed over to all owners after construction.	▪ Sustainability and maintenance information to be included in building user guide.	▪ Lead contractor responsibility
Construction Waste Target	▪ 80% construction waste recycling target for the builder	▪ 80% construction waste recycling target for the builder	▪ Architectural preliminaries to require 80% recycling of construction waste ▪ Lead contractor responsibility

5. Conclusion

The ESD components for the Loyola College STEM Building development have been proposed with reference to current construction code standards, the industry benchmarking tool BESS and Banyule City Council Planning Scheme ESD requirements. At the planning stage, the proposed design meets best practice as set out by these items.

Appendix A –NCC Part J Assessment

National Construction Code 2019 Part J – Non-Residential JV3 Report

Introduction – JV3 Report

The purpose of this component of the SMP is to show compliance of the proposed Loyola College STEM Building design with the energy efficiency requirements of the National Construction Code 2019. This report is for the information of the building surveyor and shows, based on the documentation used in the calculation and associated assumptions, the proposed Loyola College STEM Building design complies with the requirements and will meet a 11% improvement on heating and cooling based on the assumptions made in this section of the SMP.

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

Table 11 : Proposed Building Fabric Requirements

Building Element	Requirement Under JV3 Compliance Method (For Construction)
Walls	Insulation level of entire wall construction R3.2
Floor	Concrete slab on ground with no additional insulation
Roof	Metal roof sheeting Insulation of entire roof construction R4.0
External Glazing	U-values of a maximum of 4.8 (including the frame) and solar heat gain coefficient of maximum 0.4
Roof Glazing	U-values of a maximum of 3.0 (including the frame) and solar heat gain coefficient of maximum 0.25

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.

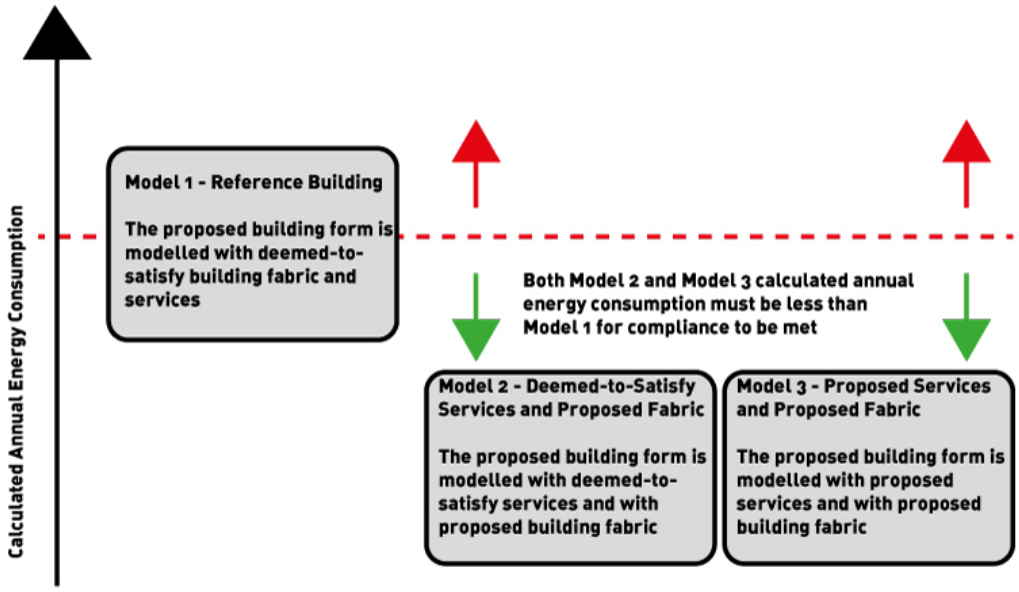

Figure 1 Illustration of the 3 Model Calculation System Required by JV3

Results JV3 Report

Table 1 below shows the calculated annual energy consumption of the Loyola College STEM 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	213.99 (Reference)
Model 2 – Deemed-to-Satisfy Services and Proposed Building Fabric	190.05 (lower than reference)
Model 3 – Proposed Services and Proposed Building Fabric	164.48 (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.

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 R3.2
Floor	Concrete slab on ground with no additional insulation	Concrete slab on ground with no additional insulation
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 façade calculator (refer to overleaf)	U-values of a maximum of 4.8 (including the frame) and solar heat gain coefficient of maximum 0.4
Roof Glazing	U-values of a maximum of 3.9 (including the frame) and solar heat gain coefficient of maximum 0.29	U-values of a maximum of 3.0 (including the frame) and solar heat gain coefficient of maximum 0.25
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 EEER and COP for cooling and heating 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

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Modelling Inputs – Façade Calculator

Wall U-Value (W/m².K)	Method 2 Glazing U-Value (W/m².K)	SHGC
0.36	4.16	0.44

Appendix B – BESS and STORM Calculations

B.1 BESS Assessment

The full BESS assessment is shown on the overleaf.

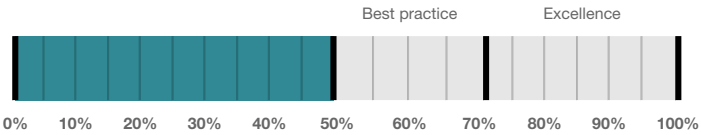
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at Loyola College Watsonia Victoria 3087. 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 Banyule 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.

Your BESS Score

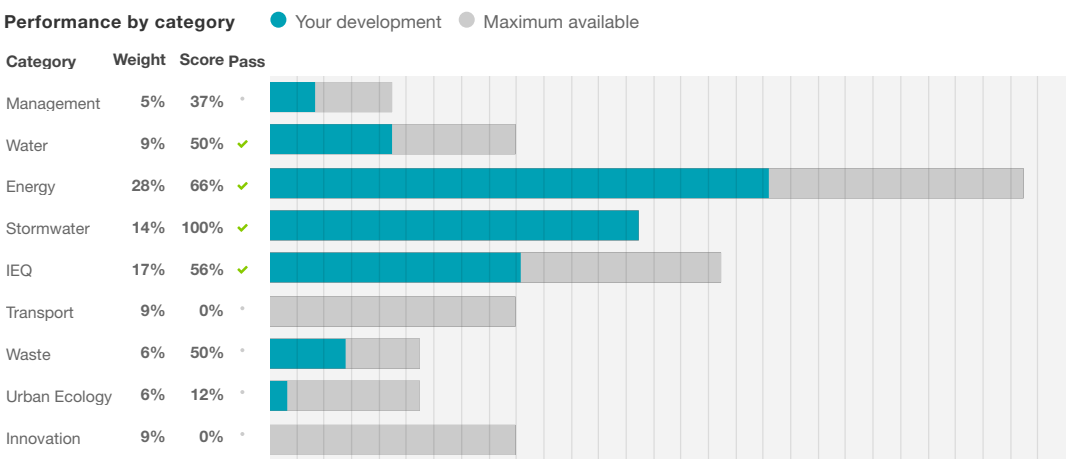


50%

Project details

Address	Loyola College Watsonia Victoria 3087
Project no	3731C97D-R4
BESS Version	BESS-6
Site type	Non-residential development
Account	patrick@ewenvironment.com.au
Application no.	
Site area	4,200.00 m²
Building floor area	2,260.00 m²
Date	19 April 2023
Software version	1.7.1-B.396

Performance by category



Buildings

Name	Height	Footprint	% of total footprint
STEM Building	3	2,260 m^2	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
Public building	1	2,260 m^2	STEM Building	100%
Total	**1**	**2,260 m^2**	**100%**	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Water 3.1	Water efficient garden annotated	To be printed Refer to architectural / landscape plans	✔
Energy 4.2	Floor plans showing location of photovoltaic panels as described.	To be printed Refer to architectural roof drawings	✔
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 Refer to architectural drawings for location of rainwater harvesting tank	✔
Waste 2.2	Location of recycling facilities	To be printed Refer to architectural site plans	✔
Urban Ecology 1.1	Size and location of communal spaces	To be printed Refer to architectural plans - common areas	✔

Supporting evidence

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment	To be printed Refer to the SMP Refer to the SMP	✔
Management 2.3b	Preliminary modelling report	To be printed Refer to the SMP Refer to the SMP	✔
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings	To be printed Refer to the SMP Refer to the SMP	✔
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.	To be printed Refer to the SMP Refer to the SMP	✔
Energy 4.2	Specifications of the solar photovoltaic system(s).	To be printed Refer to the SMP Refer to the SMP	✔

Credit	Requirement	Response	Status
Stormwater 1.1	STORM report or MUSIC model	To be printed Refer to the SMP Refer to the SMP	✔
IEQ 1.4	A short report detailing assumptions used and results achieved.	To be printed Refer to the SMP Refer to the SMP	✔

Credit summary

Management **Overall contribution 4.5%**

37%

1.1 Pre-Application Meeting	0%
2.3 Thermal Performance Modelling - Non-Residential	100%
3.2 Metering - Non-Residential	0%
3.3 Metering - Common Areas	0%
4.1 Building Users Guide	100%

Water **Overall contribution 9.0%**

Minimum required 50% **50%** ✔ **Pass**

1.1 Potable water use reduction	40%
3.1 Water Efficient Landscaping	100%
4.1 Building Systems Water Use Reduction	N/A ◈ Scoped Out
	No water use in building systems

Energy Overall contribution 27.5%

	Minimum required 50%	66%	Pass
1.1 Thermal Performance Rating - Non-Residential		37%	
2.1 Greenhouse Gas Emissions		100%	
2.2 Peak Demand		100%	
2.3 Electricity Consumption		100%	
2.4 Gas Consumption		N/A	Scoped Out
No gas supply in use.			
3.1 Carpark Ventilation		N/A	Scoped Out
No car park			
3.2 Hot Water		100%	
3.7 Internal Lighting - Non-Residential		100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	Scoped Out
No cogeneration or trigeneration system in use.			
4.2 Renewable Energy Systems - Solar		100%	
4.4 Renewable Energy Systems - Other		0%	Disabled
No other (non-solar PV) renewable energy is in use.			

Stormwater Overall contribution 13.5%

	Minimum required 100%	100%	Pass
1.1 Stormwater Treatment		100%	

IEQ Overall contribution 16.5%

	Minimum required 50%	56%	Pass
1.4 Daylight Access - Non-Residential		78%	Achieved
2.3 Ventilation - Non-Residential		66%	Achieved
3.4 Thermal comfort - Shading - Non-residential		0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

Transport Overall contribution 9.0%

	0%

1.4 Bicycle Parking - Non-Residential	0%	
1.5 Bicycle Parking - Non-Residential Visitor	0%	
1.6 End of Trip Facilities - Non-Residential	0%	⊘ Disabled
	Credit 1.4 must be complete first.	
2.1 Electric Vehicle Infrastructure	N/A	⌖ Scoped Out
	Not applicable	
2.2 Car Share Scheme	N/A	⌖ Scoped Out
	Not applicable	
2.3 Motorbikes / Mopeds	N/A	⌖ Scoped Out
	Not applicable	

Waste Overall contribution 5.5%

	50%

1.1 - Construction Waste - Building Re-Use	N/A	⌖ Scoped Out
	Not applicable	
2.1 - Operational Waste - Food & Garden Waste	0%	
2.2 - Operational Waste - Convenience of Recycling	100%	

Urban Ecology Overall contribution 5.5%

	12%

1.1 Communal Spaces	100%
2.1 Vegetation	0%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
3.2 Food Production - Non-Residential	0%

Innovation Overall contribution 9.0%

	0%

1.1 Innovation	0%

Credit breakdown

Management Overall contribution 2%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 37.5% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.3 Thermal Performance Modelling - Non-Residential		100%
Score Contribution	This credit contributes 25.0% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?	
Question	Criteria Achieved ?	
Public building	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Public building	Yes	
3.2 Metering - Non-Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have utility meters been provided for all individual commercial tenants?	
Question	Criteria Achieved ?	
Public building	No	
3.3 Metering - Common Areas		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Public building	No	
4.1 Building Users Guide		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	Yes	

Water Overall contribution 4% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools

Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes

Water fixtures, fittings and connections	
Building:	STEM Building
Showerhead:	Scope out
Bath:	Scope out
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	Scope out
WC:	>= 4 Star WELS rating
Urinals:	Scope out
Washing Machine Water Efficiency:	Scope out
Which non-potable water source is the dwelling/space connected to?:	Tank
Non-potable water source connected to Toilets:	Yes
Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No

Rainwater Tank	
What is the total roof area connected to the rainwater tank?: Tank	779 m^2
Tank Size: Tank	5,000 Litres
Irrigation area connected to tank: Tank	0.0 m^2
Is connected irrigation area a water efficient garden?: Tank	No
Other external water demand connected to tank?: Tank	0.0 Litres/Day

1.1 Potable water use reduction		40%
Score Contribution	This credit contributes 83.3% towards the category score.	
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.	
Output	Reference	
Project	3877 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	2629 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	2367 kL	
Output	% Reduction in Potable Water Consumption	
Project	38 %	
Output	% of connected demand met by rainwater	
Project	19 %	
Output	How often does the tank overflow?	
Project	Very Often	
Output	Opportunity for additional rainwater connection	
Project	380 kL	

3.1 Water Efficient Landscaping		100%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	

4.1 Building Systems Water Use Reduction		N/A	Scoped Out
This credit was scoped out	No water use in building systems		

Energy Overall contribution 18% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2019 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2019 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes

Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	-
Heating - Wood - reference fabric and reference services:	-
Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and proposed services:	-
Hot Water - Electricity - Baseline:	-
Hot Water - Electricity - Proposed:	-
Lighting - Baseline:	-
Lighting - Proposed:	-
Peak Thermal Cooling Load - Baseline:	-
Peak Thermal Cooling Load - Proposed:	-

Solar Photovoltaic system		
System Size (lesser of inverter and panel capacity):	Solar PV	15.0 kW peak
Orientation (which way is the system facing)?:	Solar PV	North
Inclination (angle from horizontal):	Solar PV	5.0 Angle (degrees)

1.1 Thermal Performance Rating - Non-Residential 37%

Score Contribution	This credit contributes 44.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?

2.1 Greenhouse Gas Emissions 100%

Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?

2.2 Peak Demand		100%	
Score Contribution	This credit contributes 5.6% towards the category score.		
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?		
2.3 Electricity Consumption		100%	
Score Contribution	This credit contributes 11.1% towards the category score.		
Criteria	What is the % reduction in annual electricity consumption against the benchmark?		
2.4 Gas Consumption		N/A	Scoped Out
This credit was scoped out	No gas supply in use.		
3.1 Carpark Ventilation		N/A	Scoped Out
This credit was scoped out	No car park		
3.2 Hot Water		100%	
Score Contribution	This credit contributes 5.6% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?		
3.7 Internal Lighting - Non-Residential		100%	
Score Contribution	This credit contributes 11.1% towards the category score.		
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1?		
Question	Criteria Achieved ?		
Public building	Yes		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.		
4.2 Renewable Energy Systems - Solar		100%	
Score Contribution	This credit contributes 5.6% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
Output	Solar Power - Energy Generation per year		
Public building	17,493 kWh		
Output	% of Building's Energy		
Public building	20 %		
4.4 Renewable Energy Systems - Other		0%	Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	Melbourne Water STORM tool
1.1 Stormwater Treatment	100%
Score Contribution	This credit contributes 100.0% towards the category score.
Criteria	Has best practice stormwater management been demonstrated?
Question	STORM score achieved
Project	121
Output	Min STORM Score
Project	100

IEQ Overall contribution 9% Minimum required 50%

1.4 Daylight Access - Non-Residential	78%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.	
Criteria	What % of the nominated floor area has at least 2% daylight factor?	
Question	Percentage Achieved?	
Public building	78 %	
2.3 Ventilation - Non-Residential	66%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.	
Criteria	What % of the regular use areas are effectively naturally ventilated?	
Question	Percentage Achieved?	
Public building	0 %	
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?	
Question	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668:2012?	
Public building	50 %	
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?	
Question	Value	
Public building	800 ppm	
3.4 Thermal comfort - Shading - Non-residential	0%	
Score Contribution	This credit contributes 17.6% towards the category score.	
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?	
Question	Percentage Achieved?	
Public building	21 %	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential	0%	
Score Contribution	This credit contributes 5.9% towards the category score.	
Criteria	What percentage of regular use areas in tenancies have ceiling fans?	
Question	Percentage Achieved?	
Public building	0 %	
4.1 Air Quality - Non-Residential	100%	
Score Contribution	This credit contributes 5.9% towards the category score.	
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?	
Question	Criteria Achieved ?	
Project	Yes	

Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes

Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes

Transport Overall contribution 0%

1.4 Bicycle Parking - Non-Residential		0%	
Score Contribution	This credit contributes 50.0% towards the category score.		
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)?		
Question	Criteria Achieved ?		
Public building	No		
Question	Bicycle Spaces Provided ?		
Public building	-		

1.5 Bicycle Parking - Non-Residential Visitor		0%	
Score Contribution	This credit contributes 25.0% towards the category score.		
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)?		
Question	Criteria Achieved ?		
Public building	No		
Question	Bicycle Spaces Provided ?		
Public building	-		

1.6 End of Trip Facilities - Non-Residential		0%	⊘ Disabled
This credit is disabled	Credit 1.4 must be complete first.		

2.1 Electric Vehicle Infrastructure		N/A	Scoped Out
This credit was scoped out	Not applicable		

2.2 Car Share Scheme		N/A	Scoped Out
This credit was scoped out	Not applicable		

2.3 Motorbikes / Mopeds		N/A	Scoped Out
This credit was scoped out	Not applicable		

Waste Overall contribution 3%

1.1 - Construction Waste - Building Re-Use		N/A	Scoped Out
This credit was scoped out	Not applicable		
2.1 - Operational Waste - Food & Garden Waste		0%	
Score Contribution	This credit contributes 50.0% towards the category score.		
Criteria	Are facilities provided for on-site management of food and garden waste?		
Question	Criteria Achieved ?		
Project	No		
2.2 - Operational Waste - Convenience of Recycling		100%	
Score Contribution	This credit contributes 50.0% towards the category score.		
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?		
Question	Criteria Achieved ?		
Project	Yes		

Urban Ecology Overall contribution 1%

1.1 Communal Spaces		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
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?	
Question	Common space provided	
Public building	150 m²	
Output	Minimum Common Space Required	
Public building	138 m²	

2.1 Vegetation		0%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	0 %	

2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	

2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	

3.2 Food Production - Non-Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Public building	0.0 m²	
Output	Min Food Production Area	
Public building	57 m²	

Innovation Overall contribution 0%

1.1 Innovation		0%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

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B.2 STORM Report

The purpose of this Water Sensitive Urban Design (WSUD) Report is to show the compliance of the Loyola College STEM Building development with Clause 53.18 Stormwater Management in Urban Development of the Banyule Planning Scheme. Clause 53.18 stipulates that water sensitive urban design must be integrated into the proposed design and measured with an accepted WSUD performance measurement tool. The tool used to undertake the calculation for the Loyola College STEM Building proposed design is Melbourne Water's STORM tool.
Banyule City Council recognizes the importance of stormwater management and the effects on the surrounding environment. Part of the ESD response includes addressing how the proposed development responds to the principles and requirements of Water Sensitive Urban Design (WSUD).
To achieve the best practice water quality performance objectives as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999 (as amended). Currently, these water quality performance objectives are:

- Suspended Solids - 80% retention of typical urban annual load;
- Total Nitrogen - 45% retention of typical urban annual load;
- Total Phosphorus - 45% retention of typical urban annual load; and
- Litter - 70% reduction of typical urban annual load.

To promote the use of water sensitive urban design, including stormwater re-use.
To mitigate the detrimental effect of development on downstream waterways, by the application of best practice stormwater management through water sensitive urban design for new developments.
To minimise peak stormwater flows and stormwater pollutants to improve the health of water bodies, including creeks, rivers and bays.
To reintegrate urban water into the landscape to facilitate a range of benefits including microclimate cooling, local habitat and provision of attractive spaces for community use and wellbeing.

The minimum STORM rating for an effective WSUD is 100% using the STORM rating calculator. The STORM rating for the proposed Loyola College STEM Building development is 121%. Refer below for the STORM Rating Report which shows all inputs and the STORM Rating Score. The rating is achieved by the implementation of a 10kL rainwater harvesting system that shall flush toilets

STORM Rating Report

TransactionID: 1564423
Municipality: BANYULE
Rainfall Station: BANYULE
Address: Loyola College Grimshaw Road
Watsonia
VIC 3087
Assessor: Patrick Phelan
Development Type: Other
Allotment Site (m2): 4,200.00
STORM Rating %: 121

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
STEM Building Roof	729.00	Rainwater Tank	10,000.00	50	136.00	68.00
New Paved Areat to East	91.00	None	0.00	0	0.00	0.00

Email confirmation from the Civil Engineer for the project (see screenshot below) confirms that post-development flow will not exceed pre-development flow.

Confirming that the post-development flow will not exceed the pre-development flow, and the site discharge flow will be controlled to match the pre-development circumstances using a control pit.

Regards
Amir Mahdavi
Civil Engineer
Level 5, 468 St Kilda Road, Melbourne, VIC, 3004
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E amir.mahdavi@miglicmacleod.com.au
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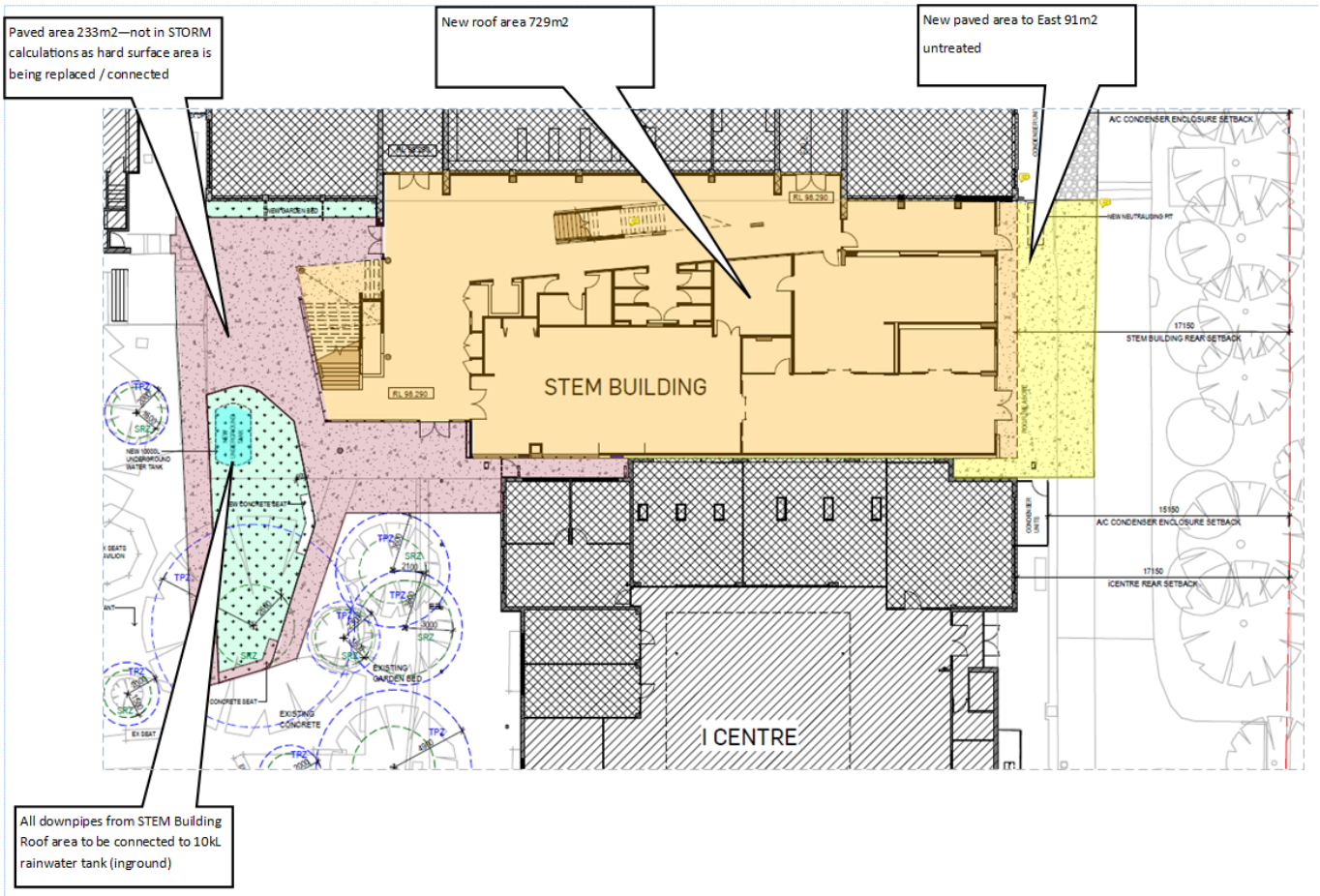
STRUCTURAL ENGINEERING | CIVIL ENGINEERING
QUANTITY SURVEYING | TENDER DEVELOPMENT

The catchment areas for the STORM calculations are shown in the marked up plan below.



The maintenance for the rainwater harvesting system shall be undertaken by the school maintenance personnel. The following maintenance regime is to be undertaken:

- Maintenance and check of pumps, first flush device and potable water backup valve / system (Davey rainbank or equivalent) shall be undertaken every 6 months
- Check entry / leaf filter into tank (if applicable) every 6 months
- Checks of gutters and pipework to tank as required noting that CCTV probe in underground pipes under building shall be conducted by the school regularly as noted by Civil consultants

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Appendix C – Daylight Assessment

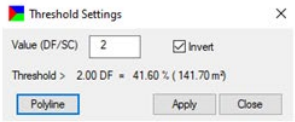
A daylight assessment has been carried out for the Loyola College STEM Building using the IES VE Software. The analysis showed that for the primary usable spaces the percentage of area achieving a daylight factor of 2% or above was 78.8% of area.

Area	Area of Primary Space Above DF 2% (m²)	Area of Primary Space (m²)	% Area of Primary Space Above DF 2%
Ground	141.0	338.9	41.6%
Level 1	401.0	440.7	91.0%
Level 2	457.4	488.4	93.7%
Total	**999.4**	**1,268.0**	**78.8%**

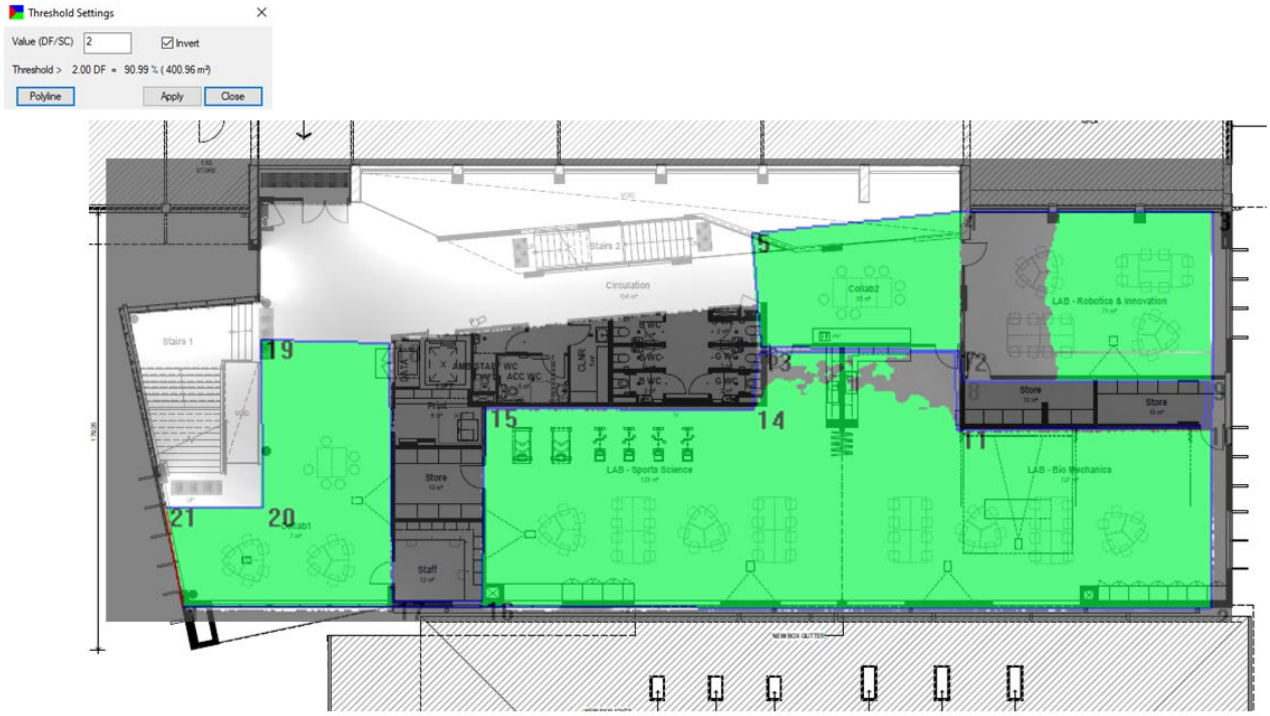
*Note that area of primary space may differ slightly from drawings due to slight error margin in importing and building models in IES.

The following table shows the daylight factor for each level and the total weighted daylight factor. Noting that circulation spaces, amenities and stores are excluded from the assessed area. I.e. only frequently used areas have been included such as classroom / lab / workshop areas, collaboration areas and staff areas. The following screenshots show the daylight results overlaid on the plans for each level.

Ground Level – Daylight Results



Level 1 – Daylight Results



Level 2 – Daylight Results

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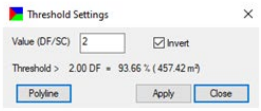

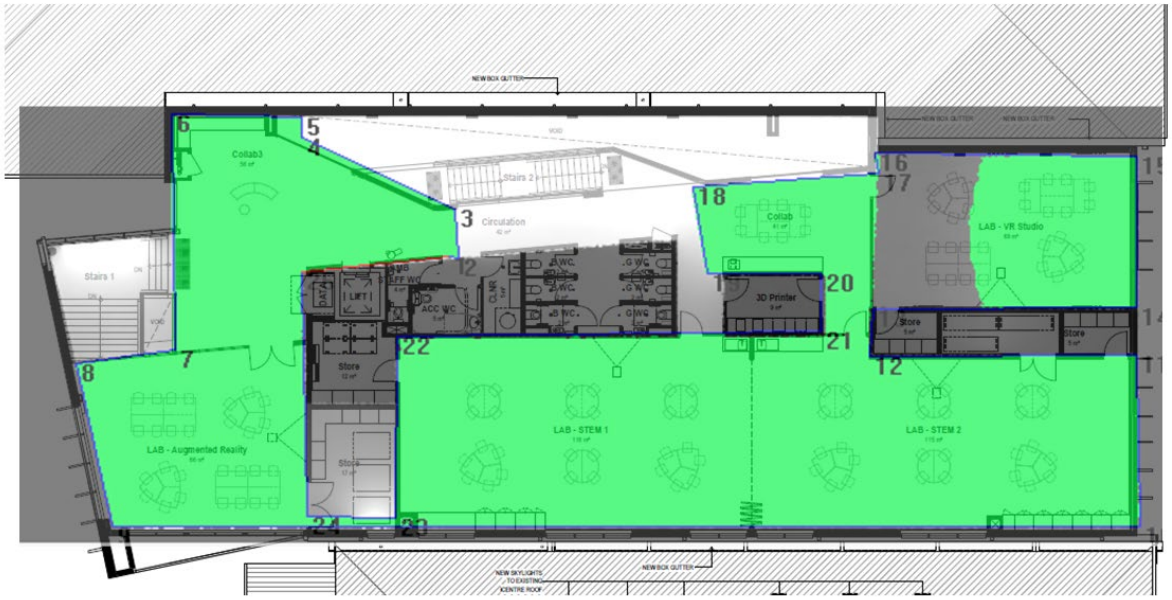

The assumptions mate for the daylight analysis are shown in the following table.

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 45% Note- this is similar to the glass selected to meet the energy efficiency requirements for these spaces
Internal glazing VLT	VLT 45%

Appendix D – Green Travel Plan

Refer to the Green Travel Plan attached on the overleaf.

Date: 29/6/2022
Project Number: PJ587
Project Title: Loyola College
Document Title: Green Travel Plan V1

LOYOLA COLLEGE GREEN TRAVEL PLAN V1

PREPARED BY PATRICK PHELAN FROM ENERGY WATER AND ENVIRONMENT CONSULTING 6/5/2022

1) Introduction

The Green Travel Plan (GTP) is intended for the proposed building works and wider site at Loyola College.

The Plan is proposed to be part of the Planning Permit. Once submitted and approved to the satisfaction of the Responsibility Authority, the Green Travel Plan will form part of the endorsed plans.

2) Aims and Objectives

The underlying objective of this Travel Plan is to reduce carbon emissions from travel and traffic congestion, to improve staff 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 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 occupants to change their travel habits
- Outline a monitoring plan to measure the success and uptake of the Plan

3) Targets

- Achieve 10% reduction on repetitive single occupancy car journeys (e.g. work, drop-off/pick-up trips to school, shopping) by 2023
- Achieve 20% increase (compared to the baseline) in sustainable travel uptake by occupants by 2023

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 occupant 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 proposed buildings
- 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 will undertake an Accessibility Assessment to see how accessible the proposed buildings is for all different modes of transport. This will inform the formulation of actions for every design stage. It will include the following:

- 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	Architect
Negotiate with your local council for improvements to footpaths	Design	Architect, School

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Ensure pedestrian safety and access is not compromised during construction or by cross sections	Design	Lead Contractor

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.	Ongoing	School
Ensure bike parking is easily accessible and clearly visible or provide signage to direct people to bike parking spaces.	Ongoing	School
Review condition and interconnection opportunities of existing onsite cycle routes	Ongoing	School
Upgrade or provide new onsite cycle routes	Ongoing	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	Ongoing	School

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g. Actions for proper designation of car parking

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

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 occupants - Commitment to implementing this Green Travel Plan - Commitment to ongoing Monitoring & Reporting – Conduct user surveys and keep records of the success/uptake of other initiatives - Commitment to appoint a travel coordinator (see below for his/her roles and responsibilities) - Commitment to keep the education and awareness program fresh and entertaining (see below for details)	Post-handover	School

5) Details of Education and Awareness Program

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

- Creating a central portal for
  - Online maps of walking paths, cycle routes and cycle parking spots
  - Tracking of targets
  - A list of facilities and design features in place that support the uptake of alternative travel plans
  - A system to allow 'buddying-up' for cycling, car-pooling and walking
  - A system to access similar programs and activities in other residential communities also
- A system to share experiences and allow interaction between occupants on Sustainable Travel options

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- Provide links to informative websites, information about local community groups and programs and annual events etc.
- Allow a bike-buddy or walk-buddy scheme to encourage uptake of cycling or walking – supported by an online system to access and connect with the buddies. This should also be supported by online information for the new starters on the routes, gears and activities.
- Appoint a Travel Coordinator who will be the first contact point for all the above information. The roles and responsibilities of a travel coordinator may include the following:
    - Responsible for developing annual or bi-annual event for the occupants e.g. 'Bike Week' or 'Car-pool Week' or 'Walking Challenge' to raise awareness and promote the benefits of cycling and walking amongst occupants who are beginning and returning to walking or cycling, or thinking about Car-pooling.
    - Arrange group discounts on travel cards
    - Take responsibility to display boards or screens in prominent locations to show public transport maps and timetables.
    - Establish and manage User groups e.g Occupants Bicycle Users Group (BUG)
    - Supply and manage a building toolkit - this can consist of puncture repair equipment, a bike pump, a spare lock and lights
    - Participate in annual events such as 'Ride to Work Day'
    - 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 should be done annually in a consistent way to collect same data on a regular basis. Progress will assessed against the targets and will be reported and analysed in a consistent way. If required, the plan or the targets will be updated and adjusted and a new set of actions will be identified to achieve the targets or to go beyond them.

A written report will be provided at the end of each Monitoring and Reporting process.

Responsibility for the Monitoring and Reporting will lie with the School. It is likely to be the responsibility of the appointed Travel Coordinator who may be supported by external third party for surveys or audits.

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

- Annual questionnaires for the occupants
- Random on-site vehicle counts during the work-hours
- Regular Accessibility assessment every two years to assess how accessible the proposed buildings is for all different modes of transport

- The monitoring report will include the following:
- Details of progress made since the submission of the last annual report and any other changes that are significant to the Plan.
- An assessment of travel questionnaire results and any other monitoring such as vehicle counts.
- An assessment of how the targets are being met
- A list of remedial measures to meet the target in the next round
- Any revisions to the Travel Plan (e.g. new list of actions)

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

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Appendix E – Template Building User Guide

Refer to the template Building User Guide that will be filled out at construction completion stage.

LYOLA COLLEGE STEM BUILDING

BUILDING USER'S GUIDE

APRIL 2023

Document Number:	01
Revision:	00
Date:	18/04/2023
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1. INTRODUCTION

This document has been developed as a guide for the managers and occupants of the building on how to operate the building in accordance with its design intent and in a safe and efficient manner. This Building User's Guide will also provide detail of the sustainability initiatives incorporated within the design of the building, which when operated correctly, can facilitate the optimisation of the building's overall design and environmental performance.

This document will outline:

- A description of the overall building and its systems;
- Operational requirements for efficient and safe use of systems;
- Strategy for reduction of energy, water usage and improvement to indoor air quality using targets, initiatives and monitoring procedures;
- Transport facilities including car parking provisions, cyclist facilities and public transport information;
- Material and waste management strategies;
- Emergency Contact Information; and
- Considerations for any futures works on the building.

1.1 BUILDING ORIENTATION

The Lyola College STEM Building is a double storey building located in Grimshaw Street Watsonia and will form part of the wider school.

A building layout is shown in Figure 1.

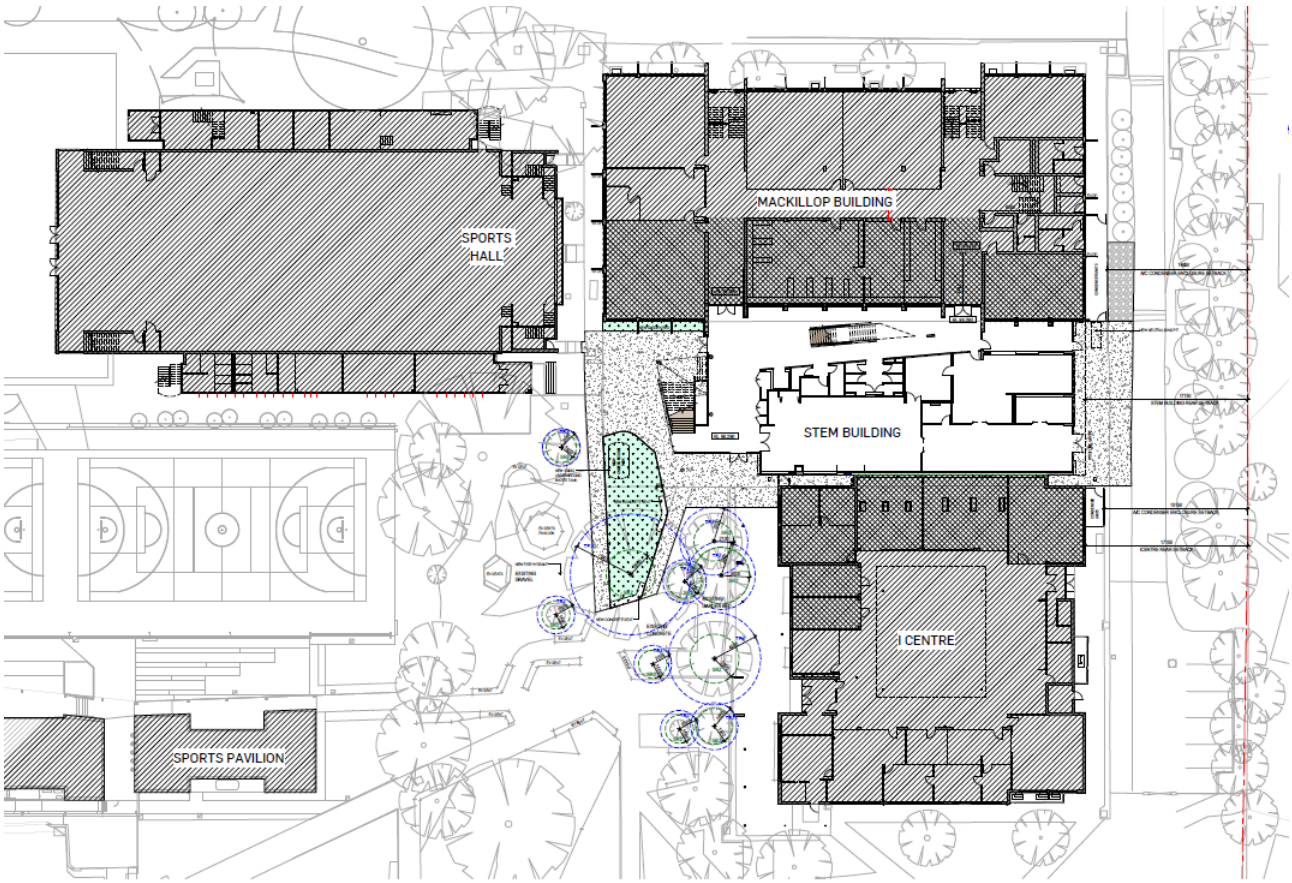

Figure 1 Lyola College STEM Building Layout

1.2 BUILDING ACCESS

The building is accessed by means of entering the campus. Noting there is existing car parking, bicycle parking and public transport available to access the site. The Route 566/902 Bus is one public transport option with Watsonia train station 400m away also.

1.3 COMMUNAL SPACES

Typical communal spaces are provided within the school grounds and within the building. There are numerous circulation and collaboration spaces for students together with a lecture hall.

1.4 DISABLED ACCESS

Each entry has accessible ramp for disabled access. There is a lift to provide access to Level 2. Each of the toilet blocks contain a Acc WC for disabled use.

2. KEY PERSONNEL

The below table summarises the details of key personnel involved with the management, operation and maintenance of the Lyola College STEM Building.

Name	Position	Responsibility	Contact Details

3. SECURITY

The Security features of the Lyola College STEM Building shall be detailed by be lead and electrical / security contractors prior to handover.

4. OVERVIEW OF BUILDING AND SYSTEMS

4.1 MECHANICAL SYSTEMS

4.1.1 AIR-CONDITIONING SYSTEMS

The air-conditioning system for the proposed site of Lyola College STEM Building is designed to operate during school operational hours. The systems are VRV systems.

Full descriptions and controls to be updated by Mechanical Contractor and Lead Contractor after commissioning and prior to handover.

4.1.2 VENTILATION SYSTEMS

The building shall be naturally ventilated. The exhaust fan systems shall and controls shall be described and updated by Mechanical Contractor and Lead Contractor after commissioning and prior to handover.

4.1.3 PREVENTATIVE MAINTENANCE PROCEDURES

The following routine and preventative maintenance program is recommended to ensure that all services are operating at its highest efficacy. It is important to note that prior to commencing any maintenance works, workers must notify the site contact upon arrival to the Lyola College STEM Building as well as inform the site contact when leaving site and filling-the site log book. If any faults are found, these should be raised with the site contact.

Refer to General and safety advice within this section and Table below outlining the relevant system, maintenance task and frequency.

General and Safety Advice

- All maintenance of the mechanical systems is to be carried out by qualified technicians.
- Ensure all appropriate PPE is being used.
- Determine which energy source will need isolating before starting work.
- Work safely and ensure your actions do not put others at risk.
- Monthly, Quarterly and Annual routines need to be carried out to comply with AS3666.2

System	Frequency	Task Description
Motorised dampers	Half yearly	Drive dampers open & closed to ensure they are driving freely
		Check damper linkages and lubricate if necessary
		Check dampers are sealing tight when closed
	Annually	Carry out Half yearly tasks where applicable
		Drive dampers open and closed to ensure they are driving freely
		Check damper linkages and lubricate if necessary
		Check dampers are sealing tight when closed
		Check for undue noise or vibration
Packaged & Ducted split AC	Monthly	Check evaporator fan & motor bearings for noise and overheating
		Check evaporator fans for excessive vibration

System	Frequency	Task Description
units and VRV Units		Check flexible connections on evaporator for leaks, tearing or fraying
		Inspect condensate trays & drains for debris & free draining
		Check evaporator coils for cleanliness
		Inspect filter condition & clean if required (notify client & provide quote if require replacing).
	Quarterly	Carry out monthly tasks where applicable
		Check fan belts for correct tension
		Check motor operating current
		Check & lubricate bearings if required
		Check suction pressure per circuit
		Check discharge pressure per circuit
		Check compressor operating current
		Check electricals for signs of overheating
		Clean up debris from machine and coils
		Check coils for cleanliness
		Check pipework for signs of leaks
		Check return air temperature
		Check room temperature setpoint
	Annually	Carry out monthly and quarterly tasks where applicable
		Clean and flush condensate trays and drains
		Clean filter plenums of dust and debris
		Check motor protection settings
		Check for correct operation of compressor safeties
		Clean any old oil stains from machine
		Check machine for refrigerant leaks
Ductwork	Annually	Check all flexible connections for tears, delamination or loose connections
		Check for physical damage
		Check for electrolysis or corrosion
		Inspect cleanliness of internal ductwork (notify client & provide quote if ductwork requires cleaning)
		Inspect any associated drainage facilities and clean where necessary
Wall hung & cassette split A/C units	Quarterly	Check motor operating currents
		Inspect filter condition & clean if require (notify client & provide quote if require replacing)
		Check & lubricate bearings if required
		Inspect condensate trays & drains for debris & free draining

System	Frequency	Task Description
		Check compressor operating current
		Check electricals for signs of overheating
		Clean up debris from machine & coils
		Check coils for cleanliness
		Check pipework for signs of leaks
		Check return air temperature
		Check supply air temperature
		Check room temperature setpoint
	Annually	Carry out quarterly tasks where applicable
		Clean and flush condensate trays and drains
		Check for correct operation of compressor safeties
		Clean any old stains from machine
		Check machine for refrigerant leaks
Mechanical services switchboards	Quarterly	Check for signs of overheating
		Check operation of indication lamps (notify client and provide if lamps require replacing)
		Check controller setpoints are adequate
		Clean any debris from enclosure
	Annually	Carry out quarterly tasks where applicable
		Check security of all electrical connections
		Check for noisy relays and contactors
Fans	Monthly	Check fan and motor bearings for noise and overheating
		Check fans for excessive vibration
		Check fan belts for wear (notify client and provide quote if requires replacing)
		Check flexible connections for leaks, tearing or fraying
	Quarterly	Carry out monthly tasks where applicable
		Check fan belts for correct tension (notify client and provide quote if requires replacing)
		Check motor operating current
		Check and lubricate bearings if required
	Annually	Carry out monthly and quarterly tasks where applicable
		Check pulley alignment and adjust as required
		Check motor protection settings
		Check and clean plenums of debris
	Monthly	Clean washable filters when necessary

System	Frequency	Task Description
Filters – Dry media, Panel, Electrostatic, Metal Viscous, Activated Carbon & Liquid		Replace disposable filters when necessary (notify client and provide quote to replace
		Advance roll filters when resistance exceeds 125Pa
		Replace high efficiency filters when resistance exceeds 250Pa above initial resistance (notify client and provide quote to replace)
		Examine electrostatic filters and screens for excessive dirt build up and clean as necessary
		Check level in oil bath for metal viscous filters and top up as necessary
	Quarterly	Carry out monthly tasks where applicable
		Check operation of door safety interlock on electrostatic filters
		Test high tension wiring between supply leads and earth on electrostatic filters, advise client of any necessary repairs
Fire Dampers (including intumescent dampers)	Annually	Inspect damper for obstructions
		Confirm position is correct
		Inspect 20% of the total each year so all fire dampers have been covered at the end of the fifth inspection.
	5-yearly	Carry out annual tasks
		Check for corrosion
		Check that mounting is sound
		Check that the integrity of the fire wall is not impaired where applicable
		Check correct operation (excluding intumescent fire dampers)
		Restore to correct position (excluding intumescent fire dampers)
		Check condition of chilled water systems including the modulating valve and valve gland packaging

4.2 ELECTRICAL SYSTEMS

The electrical light and power installation to Lyola College STEM Building comprised of the following installations:

- Main Switch Boards, Main Distribution Boards and Distribution Boards
- Incoming Mains cables, Submain cables and Subcircuit wiring
- Earthing System
- Luminaries and associated wiring
- Emergency and Exit Lighting System
- General purpose, special purpose power outlets and accessories
- Underground Conduits & Pit reticulation system
- Lighting Control System
- Emergency and Exit Lighting control system
- Distribution board supplying VT equipment
- Distribution board supplying Signalling equipment

Further electrical requirements shall be described and updated by Mechanical Contractor and Lead Contractor after commissioning and prior to handover.

4.2.1 PREVENTATIVE MAINTENANCE PROCEDURES

This section details the general and preventative maintenance program is required for efficient operation to keep the electrical installation at its design level. It is important to note that prior to commencing any maintenance works, workers must notify the site contact upon arrival to the Lyola College STEM Building as well as inform the site contact when leaving site and filling the site log book. If any faults are found, these should be raised with the site contact.

General maintenance consists of continuous monitoring for cleanliness, correct operation, installation damage and the secure fixing of equipment. Preventative maintenance should be performed in three main areas:

- Regular scheduled maintenance
- Maintenance concerned with shutdowns
- Testing of equipment and systems which are not usually in operation

Refer to General and safety advice within this section and Table XX outlining the relevant system, maintenance task and frequency.

General and Safety Advice

- No work on the installation may be undertaken without supervision by a licensed and qualified electrician.
- Aluminium ladders must not be used where there is any possibility of contact with live equipment or cables.
- No tags indicating equipment status may be removed except by the person originally fixing the tag. This instruction may only be altered by the Maintenance Supervisor after adequate inspection and testing.
- No equipment is to be taken off supply or otherwise worked on without notifying the Manager or the Manager's authorised representative.
- No equipment is to be put on supply without notifying the Manager or the Manager's authorised representative.
- All required documentation relating to any procedure must be maintained.
- Prior to working on any switchboard, the main switch (switches) must be turned **OFF** and tagged
- When working on any switchboard, a secure and identified railing or other form of barrier must be in place to prevent accidental access. The barrier must not impede the safe performance of work on the switchboard
- Circuit breakers may only be replaced with those of identical rating and characteristics.
- Areas around the switchboards must be kept clear at all times. Any breach of this must be reported to the Manager's authorised representative.

A scheduled maintenance system is outlined below. Testing of the equipment listed must be undertaken regardless of whether the equipment has operated recently. The items listed are indicative only and any equipment not listed and found to be a problem area should be included as it appears.

System	Frequency	Task Description
Switchboards	Weekly	Regular dusting and cleaning of external panels
		Check for unnatural temperature rises on any panel
	6-monthly	Carry out weekly tasks where applicable
		Examination of sub-mains and sub-circuits for any signs of chafing, mechanical damage and excessive heat. • Fittings are to be tested for 120 minutes for the initial test and 90 min thereafter with the exception that with the changing of batteries the initial test shall be repeated. Tests to comply with AS/NZS 2293.2:2019 • To perform this test, Zoneworks Exit and Emergency monitoring system installed.
	Annually and Major Shutdowns	Carry out monthly and 6-monthly tasks where applicable
		Push button test on the RCD circuit breakers
		Operating Time test by a qualified person
		Examination of irregularities, such as heat at connections, damaged insulation, moisture, loose connections, etc.
		Internal vacuuming and general cleaning of switchboards.
		Check the tension of all busbar connections
		Check the tension of all sub-circuit connections

System	Frequency	Task Description
		Check for any burning, deformity or discolouration on circuit breakers and switch contacts.
Luminaries	Weekly	Dusting of the surrounds and diffuser
		Inspection for defective globes, tubes, started and damaged diffusers
		Careful examination of the units for excessive heat and loose connection
		Verify that all luminaries and power outlets are operating correctly
	6-monthly	Carry out weekly tasks where applicable
		Exit and emergency lighting logbook should be completed as required by the code. It is anticipated that emergency and exit luminaries battery replacement would occur about 5 years after installation.
	Annually and Major Shutdowns	Carry out weekly and 6-monthly tasks where applicable
		Examination of irregularities, such as heat at connections, damaged insulation, moisture, loose connections, etc.

4.3 HYDRAULIC SYSTEM

4.3.1 SANITARY DRAINAGE

A complete gravity drainage system has been installed for all hydraulic fixtures and items of equipment that discharges into a new property connection to the authority infrastructure. The sanitary system and sewer drainage has been installed in accordance with AS 3500.

4.3.2 STORMWATER DRAINAGE

Roof Drainage and Conventional Stormwater System

To be updated by Civil and Hydraulic contractor after commissioning and prior to handover.

Rainwater Harvesting

The building is to be provided with a harvesting and reuse rainwater system. The rainwater harvesting system will consist of a gravity fed charged system collecting rainwater from the roof via the downpipes discharged into the rainwater tank. The harvested rainwater will be used for toilet flushing and irrigation. Rainwater harvested from the roof areas will be reticulated to an onsite above ground storage tank. The overflow of the rain water tank is to discharge into the civil drainage system.

The capacity of the rainwater tank is 20,000 litres. A pressurised three phase (3ph) pump system with relevant filtration is to be provided to draw water from the rainwater tank and reticulate for toilet flushing and irrigation.

4.3.3 PREVENTATIVE MAINTENANCE PROCEDURES

This section details the general and preventative maintenance program is required for efficient operation to keep the hydraulic systems at its design level. It is important to note that prior to commencing any maintenance works, workers must notify the site contact upon arrival to the Lyola College STEM Building as well as inform the site contact when leaving site and filling the site log book. If any faults are found, these should be raised with the site contact.

Refer to General and safety advice within this section and Table below outlining the relevant system, maintenance task and frequency.

General and Safety Advice

- Only qualified and competent personnel should attempt to carry out maintenance works on each of the systems
- Make sure systems are disconnected from the mains before performing any maintenance operations
- Be careful to avoid electric shock. Isolate pumps and controls before starting work.

- It is important to note before any water is shut down that all persons who are relevant are notified. Hot water shutdown procedure:
    - Switch off electrical supply at the power switch to the hot water unit (located adjacent water heater).
    - Close the cold-water isolation valve on the cold-water line to the water heater (located adjacent water heater).

A scheduled maintenance system is outlined below. Testing of the equipment listed must be undertaken regardless of whether the equipment has operated recently. The items listed are indicative only and any equipment not listed and found to be a problem area should be included as it appears.

System	Frequency	Task Description
Pumps	6-monthly	Check external condition of pumps and control gear.
		Check pumps for wear.
		Check condition of electrical equipment.
		Check pit for sludge build-up/presence for foreign objects – remove if necessary.
		Check that pump cables are securely tied up and that float switch movement is not obstructed.
		Check system operation.
		More regular servicing is required for applications where there are abrasive particles in the water, excessive silt or debris entering the pit, or where the pumps are subject to heavy usage.
Hot Water System	Monthly	Wipe the outside surface and remote controller with a wet cloth, then dry the surface. Use a neutral detergent to clean any stains. Do not use petrol, oil or fatty detergents to clean the remote controller as deformations may occur. The remote controller is water resistant but not waterproof. Keep it as dry as possible.
		If the water drain valve (with water filter) is covered with debris, the hot water may not run smoothly, or the unit may produce cold water. Check and clean the filter as explained in the manufacture's literature at the back of this manual. To avoid burns, wait until the equipment cools down before draining the water. The appliance will remain hot after it is turned off.
Thermostatic Mixing Valves	Annual	The procedure for cleaning is as follows. ○ Shut off the isolating valves incorporated into the TMV. ○ Using a bucket to collect any leakage water and taking care (as hot water may be present) remove and clean the strainer baskets. ○ Unscrew the valve cover. ○ Carefully remove internal parts. The slide valve assembly is a precision part and should be handled with care. Do not score or mark any of the faces or surfaces and do not clean with coarse or abrasive materials. ○ Wash and clean all internal parts. ○ If the valve body shows signs of heavy scaling, it is necessary to remove the AVG TMV15-PIB from the pipe work, uncouple the strainer couplings and compression fitting at the mixed water outlet. Do not grip the valve body in a vice. The slide valve seal should be removed using a special tool, which is available upon request (part No. 91020). Never re-use a slide valve seal. ○ If there are any signs of dirt in the water, the pipe work should be flushed. ○ The non-return valves for long life with no maintenance. Re-assembling of the AVG TMV15-PIB. ○ Insert the components into the valve. ○ The flanged end of the baffle tube must be inserted first into the valve body. ○ The Chamfered side of the retainer plate must face towards the coupling seal.

System	Frequency	Task Description
		○ When the internal components have been located loosely in the valve body place the valve cover over the element spring the push gently and turn until the thread on the cover engages with the body. The valve cover will automatically align all the internals inside the valve body. ○ Record the maintenance details in the maintenance report. Note: All mating faces are sealed by O-Rings in preference to gaskets so that minimal torque is required when screwing components together. When fitting ne O-Rings, it is advisable to smear sparingly with silicone grease ~ e.g. Molykote 111. The Strainers at the hot and cold-water inlets have a very large surface area so that frequent cleaning of them should not be required. Never use excessive force when dis-assembling or re-assembling the AVG TMV15-PIB. See Table XX for list of spare parts and replacement schedule
Tempering Control Valves	Annual	The Tempering Control Valves are a non-repairable / non-serviceable item with the exception of the inlet strainers (hot & cold) on each valve. It is impossible to state a set interval for checking/ cleaning these as the need is based entirely on the cleanliness of the incoming water supplies. • It is recommended the AVG TVA15C-I be checked annually by a certified plumber to ensure correct functionality of the valve. Space has been provided on the commissioning sticker to record the date & Set the temperature of the valve. • Where the water supply is of poor quality or any other supply variations are likely, it may be necessary to check the AVG TVA15C-I at more frequent intervals. • Any temperature checks should be performed at the same outlet as which the valve was first commissioned. If the temperature varies more than 3°C from the commissioned temperature started on the installation sticker or is outside of the requirements of AS3500.4.2, refer to the AVG TVA15C-I trouble shooting guide (see below). • Line strainers and non-return valves are easily accessible through the union connectors for quick cleaning. • Where line strainers continue to block it may be necessary to fit an additional filter or line strainer into the system. • This valve is a safety valve and cannot be serviced. If the valve fails to operate it is to be replaced. No attempt should be made to dismantle the valve. Any attempt to dismantle the valve (other than union connectors and adjustment cap) will void warranties.
First Flush Device	Monthly	Check the viewing window to monitor any build-up of debris. If build up occurs unscrew cap and rinse out. Window should be checked once a month or after heavy rain to prevent blockages in the system
Conventional Drainage System	6-monthly	Rainwater pipes, outlets and gratings should be inspected checked for leaks or damage and thoroughly cleaned twice a year or if overflow is discharging regularly.
		Clean gutters
Disinfection of water services	As necessary	**General** Water services used to supply potable water shall be protected against contamination during storage, construction and repairs, and be flushed and chlorinated before being placed in service and after any repairs that might lead to contamination of water. **Precautions against Contamination** Precautions shall be taken to protect the interior of pipes fittings and valves against contamination during storage, construction and repairs. **Flushing of Water Services**

System	Frequency	Task Description
		On completion of installation or repairs, water services shall be flushed at each discharge point to remove any dirty water or debris from the service. The flushing velocity in any section of the service shall be not less than 0.75 m/s. **Chlorination** After flushing, water services from storage tanks shall be chlorinated, before being placed in service, as follows: (a) Water services from storage tanks shall be disinfected by drawing chlorinated water from the storage tank into service, such that after a retention period of 6 hours, a free chlorine residual of not less than 10mg/L is obtained throughout the services (see Note 2, Paragraph H5) (b) Water services DN 80 or larger shall be disinfected as for water services from storage tank or in accordance with ANSI/WWA C651-86. **Final Flushing** After the applicable retention period, heavily chlorinated water shall not be allowed to remain in prolonged contact with service piping. In order to prevent damage to pipe lining or corrosion to pipe itself, the heavily chlorinated water shall be flushed from service until chlorine measurements show that the concentration in the water leaving the service is no higher than that generally prevailing in the authority's distribution system or is acceptable for domestic use. Notes: 1. During construction all openings in pipelines should be covered and when laid in a trench be sealed with watertight plugs during interruption to prevent contamination from water in the trench. 2. Water services that are supplied from storage tank should be disinfected at the same time as that of the disinfection of the storage tank. The water service to the tank should be closed. The discharge points on the service from the tank then opened, working progressively away from the storage tank until chlorinated water (as detected by odours) is delivered from each discharged point which should

5. GUIDANCE FOR ACHIEVING OPTIMAL SUSTAINABILITY OUTCOMES

This section outlines the benchmarks and targets that the Lyola College STEM Building is pursuing to reduce energy, water, waste consumption and indoor environment quality. The key ESD initiatives are also outlined within this section including the energy and water monitoring strategies.

Benchmarks and targets should be evaluated at regular intervals to provide accurate comparison against past/future performances. Regular updates should also be made on how benchmarks are tracked and how systems are performing to allow for any changes in operating or maintenance procedures to improve efficiency. It is also important to ensure that all operational and maintenance contracts respond/refer to the pursued building targets.

5.1 ENERGY STRATEGY

5.1.1 BENCHMARKS AND TARGETS

Benchmark Energy Use	Watts/m2
Energy Reduction Target	

Greenhouse gas emissions saved resulting from energy reduction target	Tonnes/year
Cost savings resulting from achieving energy reduction target	$/year

5.2 WATER STRATEGY

5.2.1 BENCHMARKS AND TARGETS

Benchmark Water Use	L/person/day
Water Reduction Target	
Cost savings resulting from achieving water reduction target	$/year

5.3 INDOOR ENVIRONMENTAL QUALITY

People spend around 90% of their time indoors, therefore providing a healthy and safe indoor environment is an important aspect of the design of this building.

5.3.1 BENCHMARKS AND TARGETS

Internal Operating Temperature	Degrees celsius

5.4 MATERIALS AND WASTE MANAGEMENT STRATEGIES

5.4.1 BENCHMARKS AND TARGETS

To be implemented into the guide by School and Lead Contractor at a later date

5.4.2 MATERIALS AND WASTE MANAGEMENT INITIATIVES

To be implemented into the guide by School and Lead Contractor at a later date.

Appendix F – Response to Council Comments

The following table shows responses to Council comments for the Sustainability Management Plan V1 and associated planning documentation. References are made to parts of this SMP that show further evidence where applicable.

Item	Council Comment	Response
2	Before the development permitted by this permit commences, an amended Sustainable Management Plan (SMP) must be submitted to and approved by the Responsible Authority. The SMP must be prepared by a suitably qualified environmental engineer or environmental consultant. When approved, the amended SMP will be endorsed and will form part of this permit. The plan must be generally in accordance with the SMP prepared by Energy Water Environment dated 29/06/2022 but modified to include (but not limited to):	This document (Version 2) is the amended SMP
a	An Implementation Schedule, Identifying the responsible parties and project stage for the implementation of each ESD initiative;	The 4th column in the tables of Section 4 of this SMP show the responsible parties in both design and construction phase
b	Further details of sub-metering strategy and claim BESS credit if applicable;	Non-utility meters will be installed for the building. The BESS credits for metering and sub-metering have not been claimed
c	Provide a copy of the Building Users Guide (or wireframe) to the Responsible Authority prior to occupancy to ensure adequate communication of ESD features;	A template building user guide has been provided in this updated SMP. Refer to Appendix E
d	Details of water efficient landscaping (plant species, irrigation, maintenance, mulching etc.) within Landscape Plan;	All new vegetation will be indigenous and/or drought tolerant. This credit had not been claimed in BESS. Refer to responses in Council Item 1 Landscape Plan section
e	Details of heating system, COP and EER (as only cooling is mentioned) and amend documentation accordingly;	Minimum COP and EER have been amended in the SMP. Refer to Section 4.2 and Appendix A – Modelling Inputs – JV3 Report
f	Details of electric hot water system proposed (recommend installing an energy efficient electric heat pump);	Hot water use will be confined to toilet hand washing and minimal lab use. Therefore small electric resistance hot water systems will be installed
g	Details of catchment area on dedicated WSUD Drawing showing all water related ESD initiatives;	SMP has been amended to show the catchment area. Refer to Section B.2 STORM Report in this SMP
h	Clarify misalignment between rainwater tank sizes in the SMP (5kL) and on plans (10kL);	10kL shall be provided. The SMP has been updated. Refer to Section B.2 STORM Report in this SMP
i	Confirmation that post-development stormwater flows will not exceed predevelopment levels;	Refer to screenshot email from civil consultant confirming this is the case in Section B.2

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Item	Council Comment	Response
j	Clarify whether there is any additional water filtration (beyond the rainwater tank) required prior to reuse;	No additional water filtration is proposed. Rainwater shall be collected from roof and shall be utilised in toilet flushing only
k	A full copy of the daylight modelling including floor plans and contour details;	Refer to Appendix C for updated daylight assessment
l	Breeze paths (using the requirements set out in the BESS tool notes) within the ESD Drawing to confirm achievement of credit, and consider incorporating operable windows to the south façade to increase ventilation opportunities;	Due to design constraints openable windows are not feasible however the BESS credit shall be met by increase in outside air provision by HVAC system and CO_2 monitoring. Refer to Section 4.1 for revised entry in this SMP
m	A target to reuse or recycle 80% of construction waste;	80% of construction waste shall be recycled. Refer to Section 4.10 for entry into SMP
n	An operational Waste Management Plan;	An operational waste management plan is expected to be completed before the end of the school year 2023, that will be aligned to the school's sustainability objectives, focused on recycling, reduction in energy use and reduction in single use plastics.
o	Clarify the design and location of waste storage within the new building and/or additions to existing waste facilities to accommodate increased GFA	General waste and recycling bins will be located in each room and in the circulation spaces. The school's waste management plan will implement sustainability objectives focused on recycling and reduction in usage including the use of single use plastics, therefore existing bulk waste storage facilities shall be able to accommodate the waste output of the STEM building.
p	Confirm provision of vegetated areas and amend documentation accordingly	Refer to responses in Council Item 1 Landscape Plan section
q	A Landscape Plan detailing proposed species, irrigation and maintenance considerations and cross-sections or annotations confirming adequate soil depths	Refer to responses in Council Item 1 Landscape Plan section
r	Provide a statement within the SMP that details how the building design and materiality has responded to and mitigates urban heat impacts. Consider specifying maximum Solar Absorptance (SA) of external materials within the materials schedule	The roof of the proposed building shall have a solar absorptance of no greater than 0.45
s	Confirm whether any recycled materials (e.g. bricks) or products with post-consumer content (e.g. bulk insulation) are to be used within the development	Rondo steel stud framing – made in Australia. Steel is sourced from Bluescope steel which contains on average 17.4% recycled content Colorbond steel – made in Australia, sourced from Bluescope steel see recycled content above and is itself 100% recyclable. Refer to Section 4.5 for entry into SMP
t	Clarify approach to the use of PVC products and materials	Best Environmental Practice PVC shall be used for

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Item	Council Comment	Response
		pipework, conduits and cables as defined by the Vinyl Council of Australia. Refer to Section 4.5 for updated entry in the SMP
u	Clarify strategy to reduce embodied carbon impacts of steel (through sustainable procurement and minimisation) and concrete (through reduction in Portland cement and use of SCMs);	Rondo steel stud framing – made in Australia. Steel is sourced from Bluescope steel which contains on average 17.4% recycled content Colorbond steel – made in Australia, sourced from Bluescope steel see recycled content above and is itself 100% recyclable. Refer to Section 4.5 for entry into SMP. Use of recycled content in concrete cannot be used due to risk of extension of construction program
3	Before the development permitted by this permit commences, a Environmentally Sustainable Development (ESD) Drawing must be submitted to and approved by the Responsible Authority. The ESD Drawing must be prepared by a suitably qualified environmental engineer, environmental consultant, or architect. When approved, the ESD Drawing will be endorsed and will form part of this permit. The ESD Drawing must include:	As discussed with Council ESD Officer 6/4/2023 the project team will produced a report with marked up architectural and services documentation showing ESD features
a	All features nominated within the associated SMP identified under Condition 2 (above).	All features within this SMP
	The drawing(s) must include (but not limited to) the following;	
i	A notation committing to the delivery of a Building Users Guide;	Requirements for delivery of BUG will be in documentation
ii	Rainwater Tanks volume claimed and end use connections to toilets, laundry or irrigation systems	Rainwater tank with nominated 10kL volume and connection to toilets will be shown in documentation
iii	The Water Efficiency (WELS) Rating for water fixture/fitting and appliances as nominated in their respective locations	Will be shown in documentation
iv	Water Efficient Landscaping design features	Will be specified in documentation
v	The location and system size of the Solar PV systems	Not applicable. No solar PV is proposed
vi	The NatHERS Energy Rating for each dwelling, annotated and emboldened	Not applicable. The proposed project does not contain any dwellings therefore NatHERS is not applicable
vii	The Hot Water unit type and energy rating	The electric storage units shall be specified. Noting that energy star ratings are not provided for electric storage units
vii	The Heating System type and energy rating	Minimum COP and EER have been amended in the SMP. Refer to Section 4.2 and Appendix A – Modelling Inputs – JV3 Report . Variable refrigerant flow heat pumps with heat recovery shall be specified

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ix	The Cooling System type and energy rating	Minimum COP and EER have been amended in the SMP. Refer to Section 4.2 and Appendix A – Modelling Inputs – JV3 Report . Variable refrigerant flow heat pumps with heat recovery shall be specified
x	External Lighting including Motion Detectors in their respective locations	Not applicable
xi	Internal lighting type and density of installation required to achieve 4 W/sqm efficiency	Not applicable. 20% improvement on Table J6.2a of the NCC 2019 Vol 1 overall is the nominated target. This shall be shown in final report calculations
xii	Cross-flow ventilation breeze paths annotated for each habitable room (bedrooms and living spaces), demonstrating compliance as per BESS requirements	Not applicable. Outside air requirements to meet BESS targets shall be shown
xiii	The location of double-glazed windows annotated with glazing specification (U value and SHGC) on each window	To be shown in specifications
xiv	The location of appropriate external shading devices to all east, west and north facing habitable room windows. To be fixed shading to the north and adjustable shading to the east and west, or adjustable shading to north, east and west	Not applicable
xv	Vegetated area site coverage; this is the area covered in vegetation including plantings and grass	To be shown in documentation
xvi	Details of the proposed green walls/facades/roofs including sectional details, product information, plant species, soil profiles, maintenance and watering details. A plan notation should be included that the green walls will be provided with irrigation	Not applicable
xvii	Design measures annotated to minimise the urban heat island effect. Roof colour to meet a maximum Solar Absorptance (SA) of 0.70	Maximum solar absorptance shall be 0.45. This shall be stated in specifications
xviii	Separate submetering to all major common area services	Not applicable
xix	Building Systems Water Use Reduction measures to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems	Not applicable
xx	Internal lighting type and density of installation required to achieve the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1;	Not applicable. 20% improvement on Table J6.2a of the NCC 2019 Vol 1 overall is the nominated target. This shall be shown in final report calculations
xxi	Natural Ventilation measures either (a) effectively naturally ventilated (b) increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012 (c) CO2 concentrations maintained by the ventilation systems;	Outside air requirements to meet BESS targets shall be shown
xxii	Notation for all paints, sealants and adhesives to meet the maximum total indoor pollutant emission limits;	To be shown in specifications

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Item	Council Comment	Response
xxiii	Notation for all carpet meet the maximum total indoor pollutant emission limits;	To be shown in specifications
xxiv	Notation for all engineered wood meet the maximum total indoor pollutant emission limits	To be shown in specifications
4	Before the development permitted by this permit commences, a Water Sensitive Urban Design (WSUD) Drawing must be submitted to and approved by the Responsible Authority. The WSUD Drawing must be prepared by a suitably qualified environmental engineer, environmental consultant, or architect. When approved, the WSUD Drawing will be endorsed and will form part of this permit. The WSUD Drawing must include:	As discussed with Council ESD Officer 6/4/2023 the project team will produced a report with marked up civil and hydraulic services documentation showing WSUD features
a	All features nominated within the associated SMP and STORM Report identified under Condition 2 (above), as follows:	
i	The location and storage volume (Litres) of rainwater storage tank(s), pumps and connections to end-uses, such as toilets and laundry, as claimed;	To be shown in drawings and specifications
ii	A roof plan demonstrating the portion of the roof diverted into the rainwater treatment/storage device	Shown within this SMP. Refer to Appendix B.2 STORM Report
iii	The location, area (m²) and sectional details of raingardens proposed for use in the stormwater drainage system. NB: Where in-ground raingardens or buffer strips are proposed, the grade of driveway must demonstrate that sufficient fall exists to connect to the device/s	Not applicable
iv	The location and type of other proprietary devices employed to improve the quality or reduce the loads of stormwater run-off from the site	Not applicable
v	A clear notation of the locations and respective areas (m²) of rooftop catchment, landscaped and permeable surfaces and non-permeable areas	Shown within this SMP. Refer to Appendix B.2 STORM Report
b	A Maintenance Schedule for stormwater treatment devices such as rainwater tanks, toilet connections and raingardens, including responsibility, key serviceable components and frequency of maintenance;	Shown within this SMP. Refer to Appendix B.2 STORM Report
c	STORM Report Rating Identifying a 100% pass mark without the use of SQID's, Buffer Strips and Raingardens where possible;	Shown within this SMP. Refer to Appendix B.2 STORM Report
5	Prior to the issue of Statement of Compliance or Occupation (whichever comes first), a report from the author of the Sustainable Management Plan (SMP) or a suitably qualified person must be provided to the satisfaction of the Responsible Authority. This report must confirm that all ESD features have been implemented in the development as approved. This report must at a minimum include the following:	Noted
a	*Photographic evidence of each ESD features;*	Shall be provided
b	Invoices/receipts and product specifications evidencing the energy ratings of appliances as claimed in the SMP;	Shall be provided
c	Invoices/receipts and product specifications evidencing the Water WELS ratings of fixtures and appliances as claimed in the SMP;	Shall be provided

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d	Invoices/receipts and product specifications evidencing the R-Values of all building fabric insulation used on the project;	Shall be provided
e	Invoices/receipts and product specifications evidencing the U-Values and SHGCs of windows, glazed doors and skylights as claimed in the approved Section J Energy Efficiency Report to address the NCC;	Shall be provided
f	Specifications demonstrating materials properties of low toxic and/or sustainably sourced materials (if applicable);	Shall be provided
6	Prior to the issue of Statement of Compliance or Occupation (whichever comes first), the owner or developer must notify Responsible Authority's Development Planning section that the development is complete to allow for an inspection of ESD features as shown on the endorsed documents. The Responsible Authority will visit the site to inspect or require suitable evidence to be provided, to ensure ESD features have been installed, to the satisfaction of the Responsible Authority.	Owner shall notify Responsible Authority's Development Planning section
	Please retain all manufacturers stickers on window glazing, WELS and Energy Ratings for fixtures and appliances, hot water services, heating and cooling units for evidencing purposes	
	The Responsible Authority's ESD officer has also provided the following advice to be considered regarding the ESD features of the proposed STEM building.	
	1) Request for further information	
	- Clarify granularity of metering strategy and amend documentation accordingly	Not applicable
	- Prior to construction, provide a copy of the BUG to the Responsible Authority to ensure adequate communication of ESD features	Refer to outline of BUG in this report. BUG shall be filled out across construction phase and completed prior to handover. BUG cannot be completed prior to construction as much of the operation and maintenance information to go into the BUG is only available in the construction phase (generally the latter part of construction phase)
	- Include details of water efficient landscaping (plant species, irrigation, maintenance, mulching etc.) within Landscape Plan	Refer to previous response in this table
	- COP is generally referenced for heating performance, while EER pertains to cooling. Clarify heating system and amend documentation accordingly	Refer to previous response in this table
	- Clarify type of electric hot water system proposed and recommend installing an energy efficient electric heat pump	Refer to previous response in this table
	- Provide details of catchment area on dedicated WSUD Drawing showing all water related ESD initiatives	Refer to previous response in this table
	- Clarify misalignment between rainwater tank sizes in the SMP (5kL) and on plans (10kL)	Refer to previous response in this table
	- Clarify that post-development stormwater flows will not exceed predevelopment levels	Refer to previous response in this table
	- Clarify whether there is any additional filtration required prior to reuse	Refer to previous response in this table
	- As per previous ESD advice, provide a full copy of the daylight modelling including floor plans and contour details	Refer to previous response in this table
	- Provide breeze paths (using the requirements set out in the BESS tool notes) within the ESD Drawing to confirm achievement of credit, and consider incorporating operable windows to the south façade to increase ventilation opportunities	Refer to previous response in this table
	- Amend strategy to include a target to reuse or recycle 80% of	Refer to previous response in this table

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	construction waste	
	- Provide an operational WMP	Refer to previous response in this table
	- Clarify the design and location of waste storage within the new building and/or additions to existing waste facilities to accommodate increased GFA	Refer to previous response in this table
	- Confirm provision of vegetated areas and amend documentation accordingly.	Refer to previous response in this table
	- Provide a Landscape Plan. Provide a statement within the SMP that details how the building design and materiality has responded to and mitigates urban heat impacts. Consider specifying maximum Solar Absorptance (SA) of external materials within the materials schedule	Refer to previous response in this table
	- Confirm whether any recycled materials (e.g. bricks) or products with post-consumer content (e.g. bulk insulation) are to be used within the development	Refer to previous response in this table
	- Clarify strategy to reduce embodied carbon impacts of steel (through sustainable procurement and minimisation) and concrete (through reduction in Portland cement and use of SCMs).	Refer to previous response in this table
	- Clarify approach to the use of PVC products and materials.	Refer to previous response in this table
	2) ESD Improvement Opportunities	
	- Consider increasing tank size to ensure tank reliability is maintained.	Tank size is adequate to pass STORM and BESS Water category requirements
	- Recommend revising the shading treatment for the western façade to include a more articulated angle to the fins, and include a treatment for the exposed staircase.	The fins are designed to shade the windows during school hours. The windows around the stair will be fitted with opaque glazing which will help to reduce heat transfer
	- Given the increase in GFA, there is justification for increased bicycle parking (within the school boundary). While the GTP refers to improving facilities there is little analysis comparing the existing parking yield against student numbers.	The building is a specialist building. Hence there is no increase in student numbers despite GFA increase
	- Consider increasing bicycle parking spaces in line with GFA increases	As above
	- Consider on-site management of organic waste (and reuse in gardens) or private collection of FOGO	Not feasible for this project
	- Consider climbing vegetation (using trellis or guide wires) as potential solutions for shading concerns.	Not feasible for this project
	- Consider food producing gardens for learning and capacity building	Not feasible for this project
	- Consider materials and construction methods that assist with disassembly and adaptive reuse	Noted

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