

# ACC Casey

## 271-275 Pearceedale Rd

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## *Sustainability Management Plan (Final)*

**Urbis staff responsible for this report were:**

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Project Code             P0063738  
Report Number         v01

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## *Acknowledgment of Country*

Urbis acknowledges the Traditional Custodians of the lands we operate on. We recognise that First Nations sovereignty was never ceded and respect First Nations peoples continuing connection to these lands, waterways and ecosystems for over 60,000 years. We pay our respects to First Nations Elders, past and present.

Urbis is committed to incorporating our respect for First Nations cultures, peoples and storytelling in our work across the Country. We are proud to have partnered with Darug Nation artist, **Hayley Pigram**, and to profile her artwork – **Sacred River Dreaming**.



*The river is the symbol of the Dreaming and the journey of life. The circles and lines represent people meeting and connections across time and space. When we are working in different places, we can still be connected and work towards the same goal.*

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# Introduction

This Sustainability Management Plan (SMP) together with the Built Environment Sustainability Scorecard (BESS) report, will be prepared by Urbis Ltd to address the City of Casey’s Environmentally Sustainable Design (ESD) requirements (15.01-2L-03) for Stage 1 of the proposed ACC Casey development at 271–275 Pearcedale Road, Cranbourne South, Victoria. The development is being undertaken by Christian Education Ministries (CEM) (Applicant) on behalf of Australian Christian College (Owner).

The City of Casey’s ESD policy applies to residential and non-residential developments, excluding subdivision, in line with defined thresholds. Its objective is to achieve best practice in sustainable design from the planning stage through to construction and ongoing operation. The policy promotes development that minimises environmental impacts, responds to site-specific opportunities and constraints, and adopts locally appropriate methods, processes, and technologies that deliver measurable sustainability outcomes.

This SMP outlines how the proposed development addresses the policy’s key strategies, including:

- **Energy performance:** reducing energy use and peak demand through passive design measures and provision for renewable energy technologies.
- **Integrated water management:** minimising potable water use, utilising alternative water sources, and improving stormwater quality through water sensitive urban design.
- **Indoor environmental quality:** enhancing occupant comfort, daylight access, and air quality while reducing reliance on mechanical systems.
- **Transport:** prioritising walking, cycling, and public transport, and supporting low-emission vehicle infrastructure.
- **Waste management:** promoting waste avoidance, reuse, and recycling, and ensuring flexibility for future waste needs.
- **Urban ecology:** protecting biodiversity, mitigating urban heat island effects, and encouraging productive landscapes.
- **Management:** Looking at operational practices, maintenance, and monitoring to ensure ongoing sustainability performance.
- **Innovation:** Recognises initiatives that go beyond standard ESD requirements to deliver additional environmental benefits.

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Assessment of the project’s sustainability performance has been undertaken using recognised ESD tools, including BESS, Blue Factor/MUSIC Modelling for Stormwater management, Speckel (Better Building) & ABCB calculators for energy performance. These are in accordance with the City of Casey’s planning scheme – clause 15.01-2L-03 – Environmentally sustainable development.

This report provides an overview of the proposed development sustainability strategy and how ESD considerations and objectives have been considered.

## Proposed Development

The details of the proposed development are listed below:

Proposed Development	ACC Casey
<b>Address</b>	271–275 Pearcedale Road, Cranbourne South, Victoria
<b>Climate Zone</b>	CZ 6
<b>Building Class</b>	Class 9b - Schools
<b>Number of storeys</b>	3 Storeys
<b>Total Gross Floor Area (m<sup>2</sup>)</b>	5,523 m <sup>2</sup>
<b>Total Site Area (m<sup>2</sup>)</b>	77,726 m <sup>2</sup>

# Sustainability Strategy

Although the sustainability strategy for this development is still being developed, a set of overarching principles and objectives have been established to guide planning, design, construction, and ongoing management decisions.

These principles provide a clear framework for embedding sustainability considerations throughout the development process and will be progressively refined as the design evolves, ensuring alignment with the overall development objectives. The figure below provides an overview of the key sustainability objectives across the relevant impact categories.



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# BESS Results

The preliminary sustainability performance of the proposed Stage 1 development has been evaluated using the BESS tool. The preliminary assessment measures the project's outcomes across key categories including energy, water, indoor environmental quality, transport, waste, and urban ecology. The results demonstrate how the development meets the City of Casey's planning scheme ESD requirements.

## Summary

A total BESS score of **50%** is achieved for the proposed development. A summary of the scores achieved is provided below. The Appendix section provides a more detailed overview of the results.

Table 1 Summary BESS Assessment Results.

Category	Weight	Score	Pass
Management	4.5%	12%	-
Integrated Water Management	22.5%	69%	✓
Operational Energy	27.5%	56%	✓
Indoor Environmental Quality	16.5%	56%	✓
Transport	9.0%	37%	-
Waste & Resource Recovery	5.5%	100%	-
Urban Ecology	5.5%	12%	-
Innovation	9.0%	0%	-
<b>Total</b>	<b>100%</b>	<b>50%</b>	<b>PASS</b>

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# ESD Framework

The Environmentally Sustainable Design framework integrates best practice sustainability principles into the planning, design, construction, and operation of the proposed development. It is aligned with the City of Casey's ESD Planning Scheme, ensuring environmental impacts are minimised while delivering long-term benefits for occupants and the wider community.

The framework addresses key sustainability categories: energy performance, integrated water management, indoor environmental quality, transport, waste management, and urban ecology and outlines the initiatives adopted to meet best practice standards. These measures form the basis for achieving compliance with policy requirements and supporting planning approval.

In line with the City of Casey's general ESD strategies, the framework:

- Facilitates development that minimises environmental impacts.
- Ensures the design is consistent with the type and scale of the development.
- Responds to site-specific opportunities and constraints.
- Adopts best practice through a combination of methods, processes, and locally available technologies that demonstrably reduce environmental impacts.

This integrated approach ensures that sustainability is embedded in every stage of the project, from concept design through to long-term operation, and that the development contributes positively to environmental, social, and economic outcomes.

## Indoor Environment Quality

Indoor environment quality is about creating healthy living spaces for building occupants, including rooms that are designed for optimal daylight access, to promote natural ventilation, and are comfortable with a minimal need for mechanical heating and cooling. The use of low toxicity materials and finishes also supports a health indoor air quality as off-gassing of volatile organic compounds is minimised.

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Credits	Description	Evidence
<b>1.4 Daylight Access (Non-Residential)</b>	<ul style="list-style-type: none"> <li>▪ 43% of the nominated floor areas has at least 2% daylight factor assuming a uniform design sky of 10,000 lux.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Refer to Appendix D – Preliminary Daylight Assessment</li> </ul>
<b>2.3 Ventilation (Non-Residential)</b>	<ul style="list-style-type: none"> <li>▪ A minimum of 60% of the nominated areas are effectively naturally ventilated.</li> <li>▪ A minimum of 50% increase in outdoor air (in L/s) is available to nominated floor areas, above AS 1668:2012.</li> <li>▪ The ventilation systems in the building are designed to achieve, to monitor and to maintain a minimum of 800 ppm CO<sub>2</sub> concentrations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ These requirements will be embedded into mechanical services design, with the proposed design complies with this requirement.</li> </ul>
<b>3.4 Thermal Comfort – Shading (Non-Residential)</b>	<ul style="list-style-type: none"> <li>▪ A minimum of 50% of east, north and west glazing to nominated floor areas is effectively shaded.</li> </ul>	<ul style="list-style-type: none"> <li>▪ As per the floor plans and elevation drawings, shading has been provided.</li> </ul>

# Operational Energy

The operational energy strategy for the proposed development is intended to minimise overall energy consumption and greenhouse gas emissions through the integration of efficient building design, services and technologies.

## Project Profile

A preliminary Section J – JIV3 assessment has been undertaken to meet the energy compliance requirements outlined in the NCC Section J. The detailed results are provided in Appendix B – Section J Results. All assumptions and minimum requirements relevant to the building’s compliance are listed in Appendix B of this report.

Credits	Description	Evidence Location
<b>1.1 Thermal Performance Rating (Non-Residential)</b>	Based on the preliminary NCC 2022 Section J – JIV3 assessment, there is a 16.6% reduction in heating and cooling energy consumption against the reference case.	<ul style="list-style-type: none"> <li>BESS Report &amp; Preliminary Section J – JIV3 Assessment Results (Appendix B)</li> </ul>

## NCC Section J Energy Compliance Requirements

The building fabric elements including the roof and ceiling, walls, glazing, and floor for the proposed development have been assessed in accordance with NCC 2022 Volume 1, Section J: Energy Efficiency, as published by the ABCB. Compliance has been demonstrated using the JIV3 verification method, which compares the performance of the proposed building with that of a reference building.

The table below sets out the minimum R-value requirements under Part J4 for each building fabric component. These values form the basis for demonstrating compliance at this stage of the design.

Building Fabrics	Min. R-value Requirements
<b>Roof &amp; ceiling construction</b>	Total R-value of <b>3.12</b> m <sup>2</sup> ·K/W ( <i>Upwards &amp; downwards</i> ).
<b>External wall construction</b>	<ul style="list-style-type: none"> <li>Type 1 – External metal wall construction – Total R-value of <b>1.31</b> m<sup>2</sup>·K/W.</li> <li>Type 2 – External Fibre-cement wall construction – Total R-value of <b>1.43</b> m<sup>2</sup>·K/W.</li> </ul> <p><i>Note: Refer to Appendix C for a detailed overview of wall construction assumptions.</i></p>
<b>Internal partition wall construction</b>	Nil insulation batts required.
<b>External glazing construction</b>	<ul style="list-style-type: none"> <li>All external glazing performance must be better than or equal to a total system U-value of 4.0 and SHGC of 0.40.</li> </ul>
<b>Floor construction (ground &amp; suspended)</b>	<ul style="list-style-type: none"> <li>Ground Floor construction – Total R-value of <b>1.0</b> m<sup>2</sup>·K/W.</li> <li>Internal Floor constructions – Total R-value of <b>1.0</b> m<sup>2</sup>·K/W.</li> </ul>

## Integrated Water Management

The objective of integrated water management for the proposed development is to support sustainable and responsible water use by reducing reliance on potable water supplies, minimising impacts on the local water cycle, and improving overall water efficiency. This is achieved through a holistic approach that considers water conservation, reuse opportunities, and effective management of stormwater and wastewater, ensuring

long term environmental performance, resilience and alignment with best practice water sensitive design principles.

Credits	Description	Evidence Location
<b>1.1 Potable Water Use</b>	<p><b>Rainwater Tank Profile</b></p> <p>A 200 L rainwater tank is installed and connected to 20 m<sup>2</sup> of the total roof area.</p> <p><b>Fixtures, fittings &amp; connections profiles</b></p> <ul style="list-style-type: none"> <li>Showerheads – 5 Star WELS (&gt;= 4.5 but &lt;= 6.0)</li> <li>Bath – Scoped out</li> <li>Kitchen Taps – &gt;= 4 Star WELS rating</li> <li>Bathroom Taps – &gt;= 4 Star WELS rating</li> <li>Dishwashers – &gt;= 4 Star WELS rating</li> <li>WC – &gt;= 4 Star WELS rating</li> <li>Urinals – &gt;= 4 Star WELS rating</li> <li>Washing Machine – Scoped out</li> </ul> <p>Non-potable water sources are not connected to any fixtures/ fittings in this proposed building.</p>	<ul style="list-style-type: none"> <li>Marked site plan and roof plan drawings.</li> <li>WELS rating certificates</li> </ul>

<b>2.1 Stormwater Treatment</b>	<p>The stormwater quality has been assessed using the MUSIC modelling software and it achieves a minimum of 80% reduction in flow, total suspended solids, and a minimum of 45% reduction in total phosphorus and nitrogen.</p>	<ul style="list-style-type: none"> <li>MUSIC Modelling assessment report</li> </ul>
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## Transport

The objective of the transport strategy for the proposed development is to encourage sustainable and efficient travel behaviour by prioritising active and low emission transport modes and reducing reliance on private car use. This is achieved through the provision of end of trip facilities and appropriate bicycle parking. The approach aims to improve accessibility, reduce transport related emissions, and contribute to healthier, more connected and resilient communities while aligning with broader transport and planning objectives.

Credits	Description	Evidence location
<b>1.4 Bicycle Parking (Residential &amp; Non-Residential Visitor)</b>	<p>A total of 113 bicycle parking spaces is proposed on site allocated as follows:</p> <ul style="list-style-type: none"> <li>3 spaces allocated to employees/residents.</li> <li>110 spaces allocated to customers/visitors.</li> </ul>	Marked up site plans showing the bicycle parking spaces.
<b>1.6 End of Trip Facilities (Non-Residential)</b>	<p>A minimum of 1 shower and 3 of lockers is required and the following numbers of end of trip facilities are provided as listed below.</p> <ul style="list-style-type: none"> <li>0 of showers are provided.</li> <li>0 of lockers are provided.</li> </ul>	Detailed floor plans with showers and lockers shown.

## Waste and Resource Recovery

The objective of waste and resource recovery for the proposed development is to minimise landfill disposal and improve long term operational sustainability through effective separation, storage and management of waste streams, with a particular focus on food and garden organics and recyclable materials. The approach

encourages waste reduction and resource recovery while supporting occupant participation and reducing environmental impacts associated with waste generation over the life of the development.

Credits	Description	Evidence Location
<b>2.1 Operational Food &amp; Garden Waste</b>	Facilities are provided for on-site management of food and garden waste	<ul style="list-style-type: none"> <li>Waste management Plan report</li> <li>Marked up site plan</li> </ul>
<b>2.2 Operational Waste – Convenient Waste Recycling</b>	Facilities are provided on-site for convenient recycling facilities of general waste.	<ul style="list-style-type: none"> <li>Waste Management Plan Report</li> <li>Marked up site plan</li> </ul>

## Urban Ecology

The objective of urban ecology for the proposed development is to enhance vegetation cover and ecological value by protecting existing landscape features and incorporating new, diverse and resilient planting throughout the site.

Credits	Description	Evidence Location
<b>2.1 Vegetation</b>	5% of the site is covered with vegetation and landscaping within and around the developments.	<ul style="list-style-type: none"> <li>Plans showing vegetated areas.</li> </ul>

## Construction & Building Management

The objective of the management approach for the proposed development is to embed sustainability considerations early in the design process through proactive engagement and informed decision making.

This includes undertaking a pre application meeting to clarify expectations, confirm applicable sustainability requirements and identify opportunities to optimise performance outcomes, as well as completing preliminary thermal performance modelling to inform building form, fabric and passive design strategies.

Credits	Description	Evidence location
<b>2.3 Thermal Performance Modelling (Non-Residential)</b>	A preliminary façade assessment has been undertaken in accordance with NCC 2022 Section J4D6 of the volume 1 code.	<ul style="list-style-type: none"> <li>Section J – JIV3 Assessment report</li> </ul>

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# Appendices

## Appendix A BESS Report

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# BESS Report

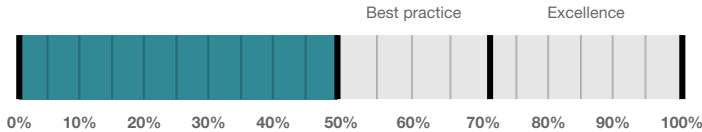
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 271-275 Pearcedale Rd Cranbourne South Victoria 3977. 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 Casey 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

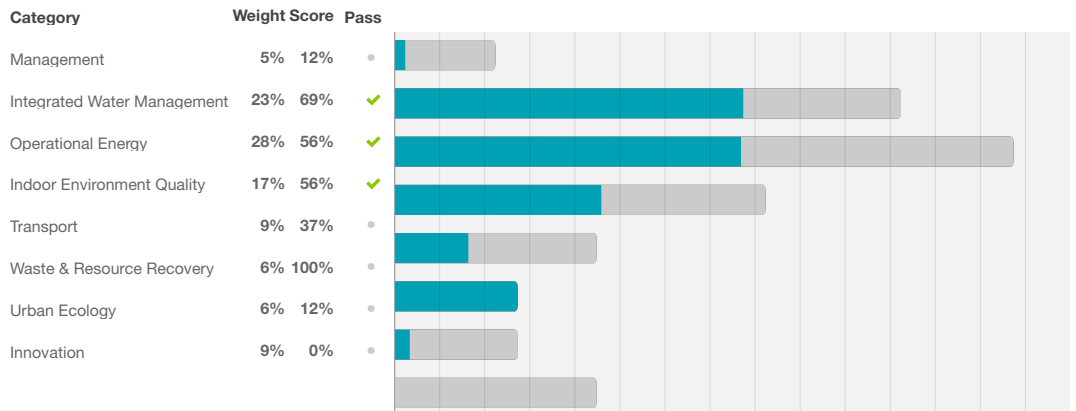
Name	ACC Casey
Address	271-275 Pearcedale Rd Cranbourne South 3977
Project ID	A2C26D23-R1
BESS Version	BESS-10
Date	09 April 2023
Software version	2.3.0-B.649
Site type	Non-residential development
Account	gsuresh@urbis.com.au
Application no.	
Site area	77,726 m <sup>2</sup>
Building floor area	5,523 m <sup>2</sup>

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## Performance by category

● This project ● Maximum available



## Buildings

Name	Height	Footprint	% of total footprint
Proposed 3 Storey Building	3	5,523 m <sup>2</sup>	100%

## Dwellings & Non Res Spaces

### Non-Res Spaces

Name	Quantity	Area	Building	% of total area
<b>Other building</b>				
Proposed 3 Storey Building	1	5,523 m <sup>2</sup>	Proposed 3 Storey Building	100%
<b>Total</b>	<b>1</b>	<b>5,523 m<sup>2</sup></b>	<b>100%</b>	

## Supporting Evidence

### Shown on Floor Plans

Credit	Requirement	Response	Status
Integrated Water Management 2.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)	To be printed To be shown on plans	✓
Transport 1.4	Location of non-residential visitor bicycle parking spaces	To be printed To be shown on plans	✓
Transport 1.5	Location of non-residential visitor bicycle parking spaces	To be printed To be shown on plans	✓
Waste & Resource Recovery 2.1	Location of food and garden waste facilities	To be printed To be shown on plans	✓
Waste & Resource Recovery 2.2	Location of recycling facilities	To be printed To be shown on plans	✓
Urban Ecology 2.1	Location and size of vegetated areas	To be printed To be shown on plans	✓

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### Supporting Documentation

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment	To be printed RPT_P0063738_Section J Assessment_v1_20260410	✓
Integrated Water Management 2.1	STORM report or MUSIC model	To be printed Stormwater report	✓
Operational Energy 1.1	Energy Report showing calculations of reference case and proposed buildings	To be printed RPT_P0063738_Section J Assessment_v1_20260410	✓
Operational Energy 3.7	Average lighting power density and lighting type(s) to be used	To be printed	✓
Indoor Environment Quality 1.4	A short report detailing assumptions used and results achieved.	To be printed RPT_P0063738_Sustainability Management Plan_v1_20260410	✓

## Credit summary

### Management Overall contribution 4.5%

		<b>12%</b>
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		50%
3.2 Metering - Non-Residential		0%
3.3 Metering - Common Areas		0%
4.1 Building Users Guide		0%

### IWM Overall contribution 22.5%

		<b>69%</b> <span style="color: green;">✔ Pass</span>
1.1 Potable Water Use		41% <span style="color: green;">✔ Achieved</span>
2.1 Stormwater Treatment		100% <span style="color: green;">✔ Achieved</span>
3.1 Water Efficient Landscaping		0%
4.1 Building Systems Water Use		0%

### Operational Energy Overall contribution 27.5%

		<b>56%</b> <span style="color: green;">✔ Pass</span>
1.1 Thermal Performance Rating - Non-Residential		37%
2.1 Greenhouse Gas Emissions		100%
2.2 Peak Demand		100%
2.6 Electrification		0%
2.7 Energy consumption		100%
3.1 Carpark Ventilation		0%
3.2 Hot Water - Non-Residential		100%
3.7 Internal Lighting - Non-Residential		100%
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A <span style="color: orange;">✦ Scoped Out</span>
No cogeneration or trigeneration system in use.		
4.2 Renewable Energy Systems - Solar		0% <span style="color: grey;">⊘ Disabled</span>
No solar PV renewable energy is in use.		
4.4 Renewable Energy Systems - Other		N/A <span style="color: orange;">✦ Scoped Out</span>
No other (non-solar PV) renewable energy is in use.		

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**IEQ Overall contribution 16.5%**

		<b>Minimum required 50%</b>	<b>56%</b>	<b>✔ Pass</b>
1.4 Daylight Access - Non-Residential			43%	✔ Achieved
2.3 Ventilation - Non-Residential			83%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential			66%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
4.1 Air Quality - Non-Residential			0%	

**Transport Overall contribution 9.0%**

		<b>37%</b>
1.4 Bicycle Parking - Non-Residential		100%
1.5 Bicycle Parking - Non-Residential Visitor		100%
1.6 End of Trip Facilities - Non-Residential		0%
2.1 Electric Vehicle Infrastructure		0%
2.2 Car Share Scheme		0%
2.3 Motorbikes / Mopeds		0%

**Waste & Resource Recovery Overall contribution 5.5%**

		<b>100%</b>	
1.1 Construction Waste - Building Re-Use		N/A	✦ Scoped Out
2.1 Operational Waste - Food & Garden Waste		100%	
2.2 Operational Waste - Convenience of Recycling		100%	

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**Urban Ecology Overall contribution 5.5%**

		<b>12%</b>
1.1 Communal Spaces		0%
2.1 Vegetation		25%
2.2 Green Roofs		0%
2.3 Green Walls and Facades		0%
3.2 Food Production - Non-Residential		0%

**Innovation Overall contribution 9.0%**

		<b>0%</b>	
1.1 Innovation		0%	⊘ Disabled
Achieve a project score of 50% or above to enable this credit.			



**IWM Overall contribution 22.5%**

		69% <span style="color: green;">✔</span> Pass
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Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No

<b>Stormwater profile</b>	
Which stormwater modelling software are you using?:	MUSIC or other modelling software
Blue Factor score achieved?:	100
Flow:	70 %
Total Suspended Solids:	80 %
Total Phosphorus:	45 %
Total Nitrogen:	45 %

<b>Rainwater tank profile</b>	
What is the total roof area connected to the rainwater tank?:	
Rainwater Tank 1	20.0 m²
	-
Tank Size:	
Rainwater Tank 1	200 Litres
Irrigation area connected to tank:	
Rainwater Tank 1	0.0 m²
Is connected irrigation area a water efficient garden?:	
Rainwater Tank 1	No
Other external water demand connected to tank?:	
Rainwater Tank 1	0.0 Litres/Day
	-

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<b>Fixtures, fittings &amp; connections profile</b>	
Building:	Proposed 3 Storey Building
Showerhead:	5 Star WELS (>= 4.5 but <= 6.0)
Bath:	Scope out
Kitchen Taps:	>= 4 Star WELS rating
Bathroom Taps:	>= 4 Star WELS rating
Dishwashers:	>= 4 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	>= 4 Star WELS rating
Washing Machine Water Efficiency:	Scope out
Which non-potable water source is the dwelling/space connected to?:	Rainwater Tank 1
Non-potable water source connected to Toilets:	No

Non-potable water source connected to Laundry (washing machine):		No
Non-potable water source connected to Hot Water System:		No
<b>1.1 Potable Water Use</b>		41% <span style="color: green;">✔</span> Achieved
Score Contribution	This credit contributes 31.2% 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	10125 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	7452 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	7452 kL	
Output	% Reduction in Potable Water Consumption	
Project	26 %	
Output	% of connected demand met by rainwater	
Project	0 %	
Output	How often does the tank overflow?	
Project	Very Often	
Output	Opportunity for additional rainwater connection	
Project	3079 kL	
<b>2.1 Stormwater Treatment</b>		100% <span style="color: green;">✔</span> Achieved
Score Contribution	This credit contributes 31.2% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Output	Flow	
Project	70 %	
Output	Min Suspended Solids reduction	
Project	80 %	
Output	Total Suspended Solids reduction	
Project	80 %	
Output	Min Phosphorus reduction	
Project	45 %	
Output	Total Phosphorus reduction	
Project	45 %	
Output	Min Nitrogen reduction	
Project	45 %	
Output	Total Nitrogen reduction	
Project	45 %	
<b>3.1 Water Efficient Landscaping</b>		0%

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Score Contribution	This credit contributes 6.2% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	No

**4.1 Building Systems Water Use** 0%

Score Contribution	This credit contributes 6.2% towards the category score.
Criteria	Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?
Question	Criteria Achieved ?
Project	No



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**Operational Energy Overall contribution 27.5%**

		Minimum required 50%	56% <span style="color: green;">✔</span> Pass
--	--	----------------------	---

<b>Project profile</b>	
Use the BESS Deem to Satisfy (DtS) method for Non-residential No spaces?:	
Are you installing any renewable energy system(s) (other than solar photovoltaic)?:	No
Energy Supply:	All-electric
<b>Non-residential buildings profile</b>	
Heating, Cooling & Comfort Ventilation Electricity Reference fabric and Reference services:	139,311 kWh
Heating, Cooling & Comfort Ventilation Electricity <u>Proposed fabric</u> and Reference services:	117,065 kWh
Heating, Cooling & Comfort Ventilation Electricity <u>Proposed fabric</u> and <u>Proposed services</u> :	117,065 kWh
Heating Wood Reference fabric and Reference services:	0.0 MJ
Heating Wood <u>Proposed fabric</u> and Reference services:	0.0 MJ
Heating Wood <u>Proposed fabric</u> and <u>Proposed services</u> :	0.0 MJ
Hot Water Electricity - Reference:	1,000 kWh
Hot Water Electricity - <u>Proposed</u> :	1,000 kWh
Lighting Electricity - Reference:	59,647 kWh
Lighting Electricity - <u>Proposed</u> :	106,039 kWh
Peak Thermal Cooling Load Reference:	0.0 kW
Peak Thermal Cooling Load <u>Proposed</u> :	0.0 kW
<b>1.1 Thermal Performance Rating - Non-Residential</b>	37%
Score Contribution	This credit contributes 34.8% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?
<b>2.1 Greenhouse Gas Emissions</b>	100%

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Score Contribution	This credit contributes 8.7% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
<b>2.2 Peak Demand</b>		100%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
<b>2.6 Electrification</b>		0%
Score Contribution	This credit contributes 13% towards the category score.	
Criteria	Is the development all-electric?	
Question	Criteria Achieved?	
Project	No	
<b>2.7 Energy consumption</b>		100%
Score Contribution	This credit contributes 17.4% towards the category score.	
Criteria	What is the % reduction in annual energy consumption against the benchmark?	
<b>3.1 Carpark Ventilation</b>		0%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	Is the carpark enclosed or partially enclosed and naturally ventilated (no mechanical ventilation) or 100% fresh air supply with Carbon Monoxide monitoring to control CO levels and level of ventilation fans?	
Question	Criteria Achieved?	
Project	No	
<b>3.2 Hot Water - Non-Residential</b>		100%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?	
<b>3.7 Internal Lighting - Non-Residential</b>		100%
Score Contribution	This credit contributes 8.7% 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 J7D3a of the NCC 2022 Vol 1?	
Question	Criteria Achieved ?	
Other building	Yes	
<b>4.1 Combined Heat and Power (cogeneration / trigeneration)</b>		N/A  Scoped Out
	No cogeneration or trigeneration system in use.	
This credit was scoped out	No cogeneration or trigeneration system in use.	
<b>4.2 Renewable Energy Systems - Solar</b>		0%  Disabled
	No solar PV renewable energy is in use.	
This credit is disabled	No solar PV renewable energy is in use.	

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4.4 Renewable Energy Systems - Other

N/A ✦ Scoped Out

No other (non-solar PV) renewable energy is in use.

This credit was scoped out

No other (non-solar PV) renewable energy is in use.

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**IEQ Overall contribution 16.5%**

		<b>Minimum required 50%</b>	<b>56%</b>	<b>✔ Pass</b>
--	--	-----------------------------	------------	---------------

**1.4 Daylight Access - Non-Residential** 43% **✔ 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?
Other building	43 %

**2.3 Ventilation - Non-Residential** 83% **✔ 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?
Other building	60 %

Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?
Question	Percentage Achieved?
Other building	50 %

Criteria	What percentage of regular use areas are equipped with systems designed to achieve, to monitor and maintain acceptable indoor air quality?
Question	Percentage Achieved?
Other building	0 %

**3.4 Thermal comfort - Shading - Non-Residential** 66%

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?
Other building	50 %

**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?
Other building	0 %

**4.1 Air Quality - Non-Residential** 0%

Score Contribution	This credit contributes 5.9% towards the category score.
--------------------	--

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Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Other building	No
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Other building	No
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Other building	No

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**Transport Overall contribution 9.0%**

		<b>37%</b>
--	--	------------

**1.4 Bicycle Parking - Non-Residential** 100%

Score Contribution	This credit contributes 25% 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 ?
Other building	Yes
Question	Bicycle Spaces Provided ?
Other building	3

**1.5 Bicycle Parking - Non-Residential Visitor** 100%

Score Contribution	This credit contributes 12.5% 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 ?
Other building	Yes
Question	Bicycle Spaces Provided ?
Other building	1

**1.6 End of Trip Facilities - Non-Residential** 0%

Score Contribution	This credit contributes 25% towards the category score.
Criteria	Has adequate bicycle parking been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, changing facilities adjacent to showers; and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?
Question	Number of showers provided ?
Other building	0
Question	Number of lockers provided ?
Other building	0
Output	Min Showers Required
Other building	1
Output	Min Lockers Required
Other building	3

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**2.1 Electric Vehicle Infrastructure** 0%

Score Contribution	This credit contributes 25% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	No

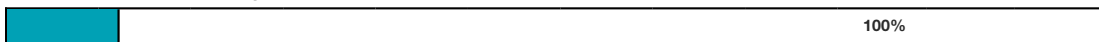
**2.2 Car Share Scheme** 0%

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	No

<b>2.3 Motorbikes / Mopeds</b>	0%
--------------------------------	----

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	No

**Waste & Resource Recovery Overall contribution 5.5%**



<b>1.1 Construction Waste - Building Re-Use</b>	N/A ✦ Scoped Out
This is a new development and there has been on development on the site previously.	

This credit was scoped out      This is a new development and there has been on development on the site previously.

<b>2.1 Operational Waste - Food &amp; Garden Waste</b>	100%
--	------

Score Contribution	This credit contributes 50% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	Yes

<b>2.2 Operational Waste - Convenience of Recycling</b>	100%
---	------

Score Contribution	This credit contributes 50% 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

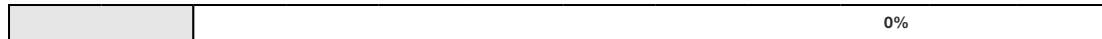
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**Urban Ecology Overall contribution 5.5%**

		12%
<b>1.1 Communal Spaces</b>		
		0%
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 : * 1m <sup>2</sup> for each of the first 50 occupants * Additional 0.5m <sup>2</sup> for each occupant between 51 and 250 * Additional 0.25m <sup>2</sup> for each occupant above 251?	
Question	Common space provided	
Other building	-	
Output	Minimum Common Space Required	
Other building	206 m <sup>2</sup>	
<b>2.1 Vegetation</b>		
		25%
Score Contribution	This credit contributes 50% 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	5 %	
<b>2.2 Green Roofs</b>		
		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	
<b>2.3 Green Walls and Facades</b>		
		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	
<b>3.2 Food Production - Non-Residential</b>		
		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	
Other building	0.0 m <sup>2</sup>	
Output	Min Food Production Area	
Other building	70 m <sup>2</sup>	

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**Innovation Overall contribution 9.0%**



<b>1.1 Innovation</b>	0% <input checked="" type="checkbox"/> Disabled
Achieve a project score of 50% or above to enable this credit.	
This credit is disabled	Achieve a project score of 50% or above to enable this credit.

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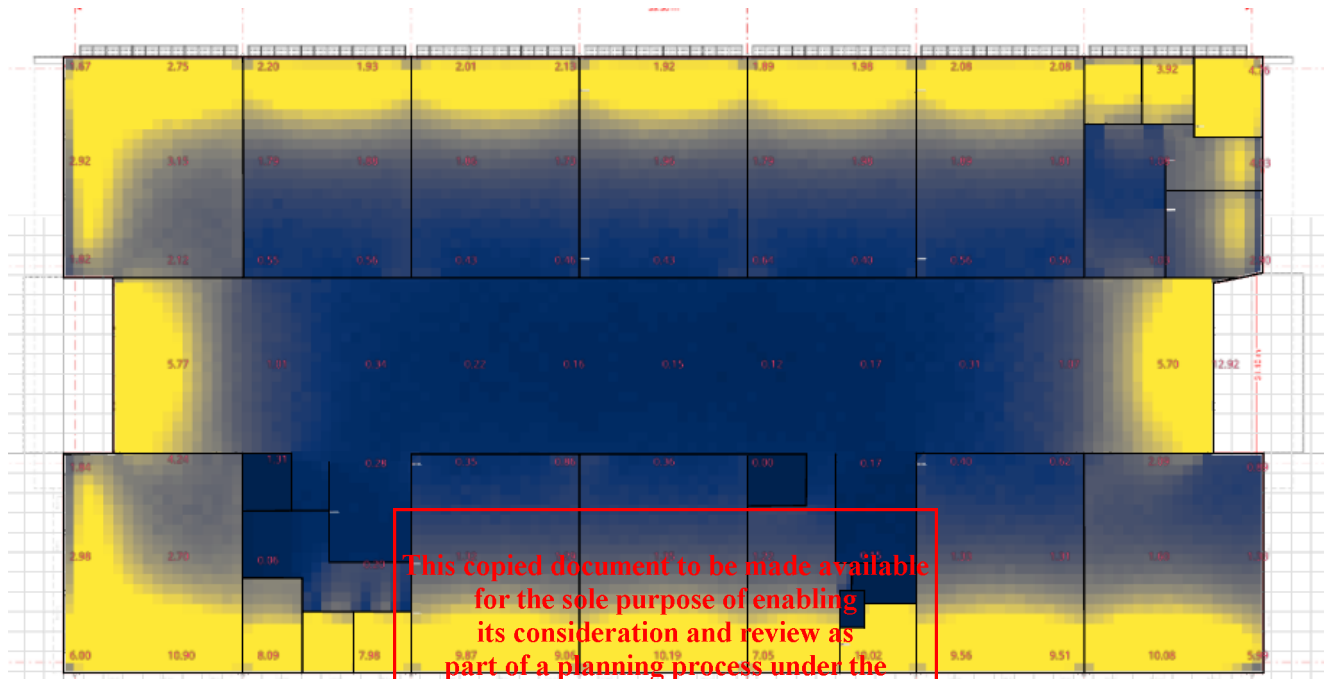
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# Appendix B Daylight Assessment

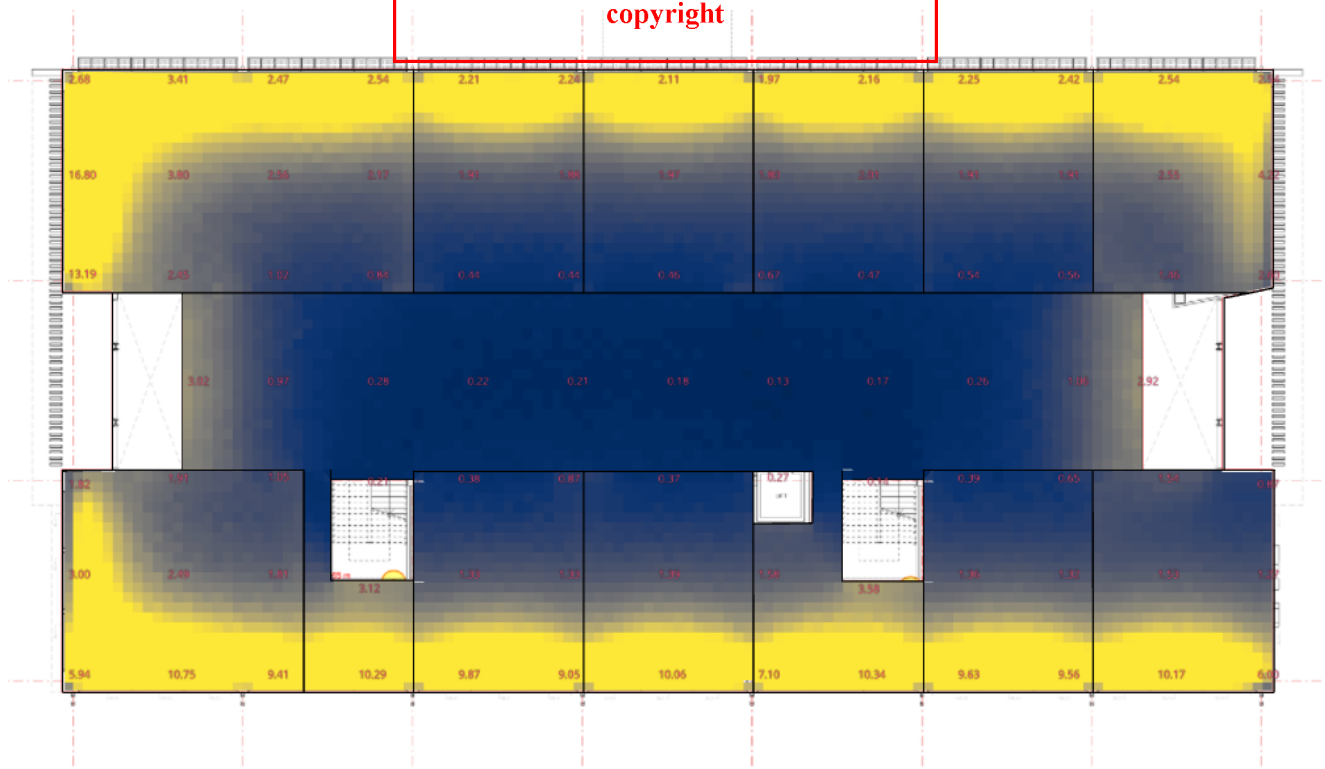
To achieve daylight compliance, at least 30% of the total assessed area must meet the requirement that a daylight factor greater than 2.0% is achieved across at least 33% of each zone.

In this assessment, 36,511 sensor points were modelled, representing a total area of 5,523 m<sup>2</sup>. Of this, **43.04%** of the area achieved a daylight factor greater than 2.0%, meeting the compliance requirement.

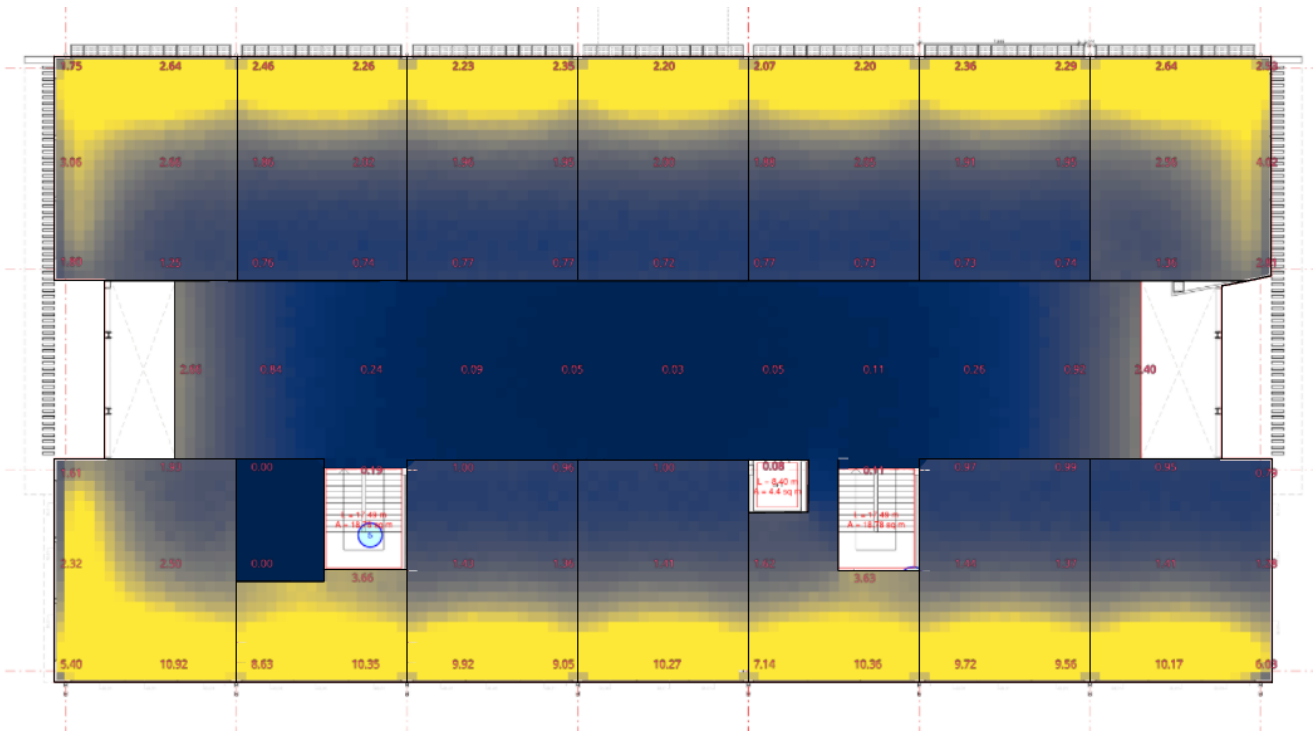
## Ground Floor



## Level 1



**Level 2**



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## Appendix C Stormwater Calculator Results

The following results have been provided by Woolacotts who have been engaged to develop a stormwater management plan for this site.

Stormwater profile  
Enter the stormwater quality modelling type and results for your project.  
[View Tool Notes](#)

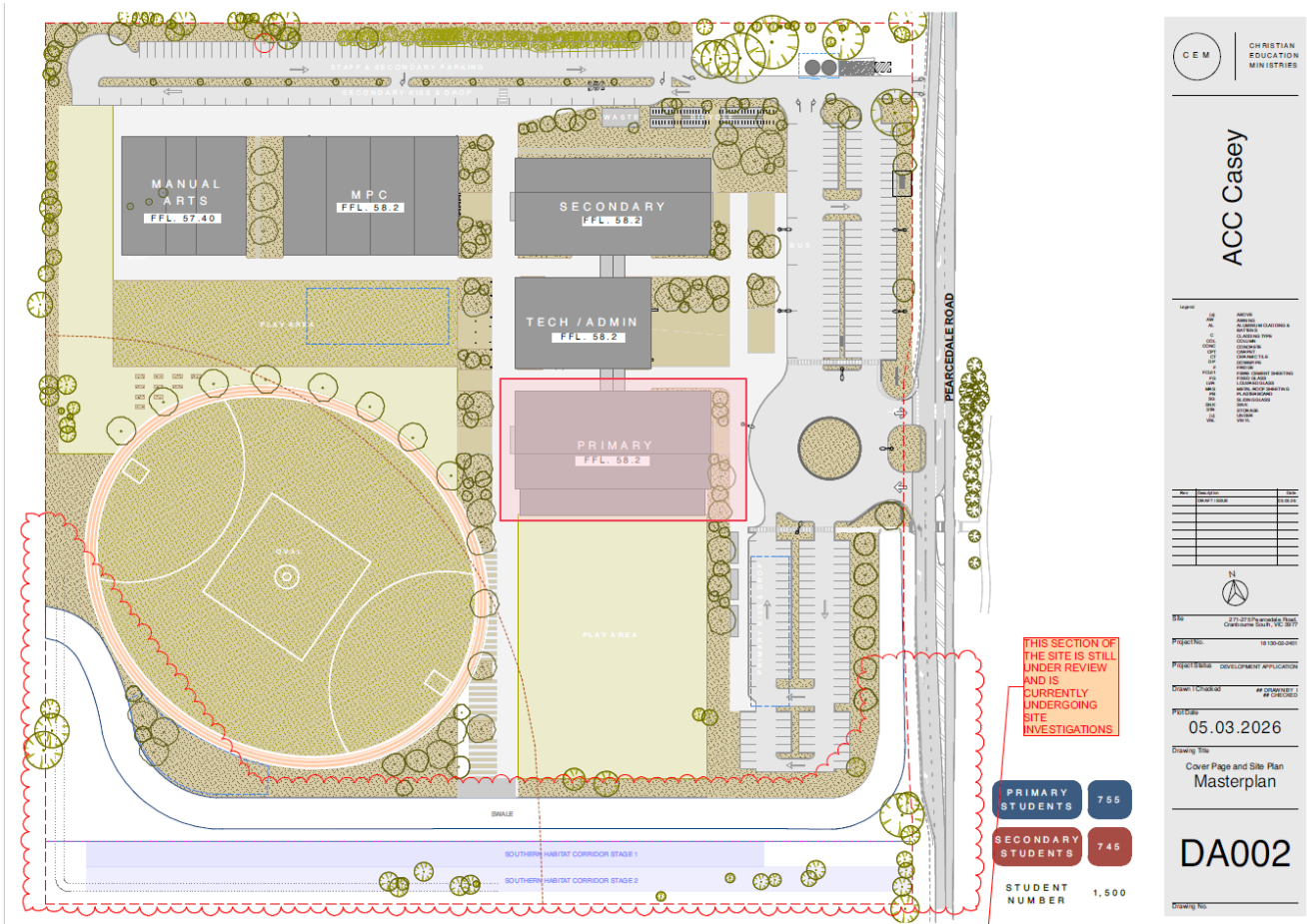
Which stormwater modelling software are you using?	?	MUSIC or other modelling software	
Flow	?	70	% Reduction
Total Suspended Solids	?	80	% Reduction
Total Phosphorus	?	45	% Reduction
Total Nitrogen	?	45	% Reduction

*Note: These numbers are provided based on the Melbourne Water BPEMG WSUD requirements.*

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# Appendix D Site Plan

This SMP has been developed for the *Proposed 3 storey building* as part of Stage 1 as outlined below.



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C E M CHRISTIAN EDUCATION MINISTRIES

## ACC Casey

Project No: 1810000001  
 Date: 05.03.2026  
 Drawing Title: Cover Page and Site Plan  
 Masterplan  
 DA002

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Shaping cities  
and communities  
for a better future.

# ACC Casey

## 271 - 275 Pearcedale Rd

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### Section J - J1V3 Assessment Report Final

**Urbis staff responsible for this report were:**

Director                    Brenton Reynolds  
Associate Director    Angela Forero  
Consultant                Gitu Suresh  
Project Code             P0063738  
Report Number         v01 (Final)

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## *Acknowledgment of Country*

Urbis acknowledges the Traditional Custodians of the lands we operate on. We recognise that First Nations sovereignty was never ceded and respect First Nations peoples continuing connection to these lands, waterways and ecosystems for over 60,000 years. We pay our respects to First Nations Elders, past and present.

Urbis is committed to incorporating our respect for First Nations cultures, peoples and storytelling in our work across the Country. We are proud to have partnered with Darug Nation artist, **Hayley Pigram**, and to profile her artwork – **Sacred River Dreaming**.



*The river is the symbol of the Dreaming and the journey of life. The circles and lines represent people meeting and connections across time and space. When we are working in different places, we can still be connected and work towards the same goal.*

All information supplied to Urbis in order to conduct this research has been treated in the strictest confidence. It shall only be used in this context and shall not be made available to third parties without client authorisation. Confidential information has been stored securely and data provided by respondents, as well as their identity, has been treated in the strictest confidence and all assurance given to respondents have been and shall be fulfilled.

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# Compliance Summary

The compliance summary outlines the proposed building's compliance with the National Construction Code (NCC) 2022, volume 1 Section J requirements as detailed below.

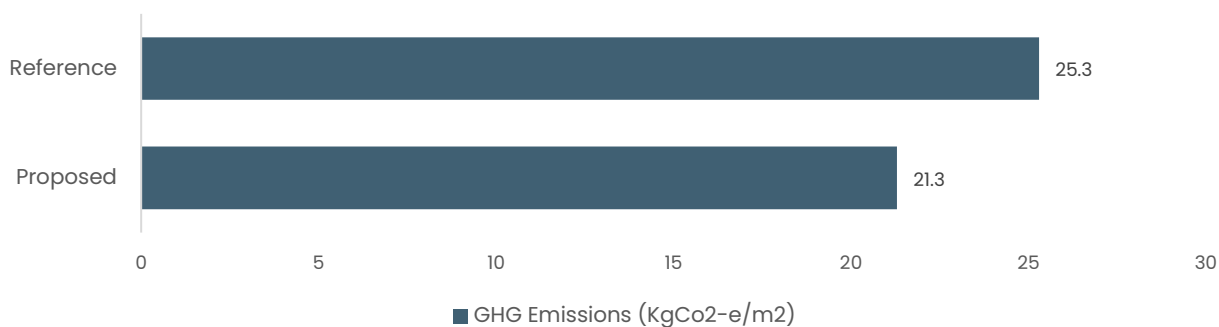
## Building Energy Emissions

The thermal performance of this building is measured by the energy consumed for the operation of the building's services, expressed as a theoretical greenhouse gas emissions intensity per square meter, based on the state of VIC.

Under the JIV3 Verification Method, the greenhouse gas (GHG) emissions of a reference building (based on the Deemed-to-Satisfy Provisions for both envelope and minimum services) is modelled. This sets a target amount of energy consumption that the proposed building must not exceed. The simulated energy loads of the Reference Building are expressed as the maximum allowable GHG emissions per square meter area and are calculated to be **25.3 kgCO<sub>2</sub>-e/m<sup>2</sup>** for this building.

The material construction (or fabric) of the proposed building envelope is modelled with the same building services. Compliance is verified when it is determined that the greenhouse gas emissions per square meter area of the proposed building, is not more than reference building. The proposed GHG emissions is calculated to be **21.3 kgCO<sub>2</sub>- e/m<sup>2</sup>**.

This is an overall **15.8%** reduction in greenhouse gas emissions from the reference building.



## Thermal Comfort (PMV)

As part of the Section J requirement, the proposed building must also achieve thermal comfort level between a PMV of -1 to +1 across 95% of the total area for at least 98% of hours of operation.

A total area of 5523 m<sup>2</sup> across 46 zones were assessed, where zones of **98%** floor area achieved the conditions, meeting the acceptance criteria.

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# Introduction

This Section J-JIV3 Assessment report will be prepared by Urbis Ltd to demonstrate compliance with JIP1 Energy Use under Section J of the National Construction Code (NCC) 2022, Volume 1 for stage 1 of the proposed ACC Casey development at 271-275 Pearcedale Road, Cranbourne South, Victoria. The development is being undertaken by Christian Education Ministries (CEM) (Applicant) on behalf of Australian Christian College (Owner).

The NCC specifies minimum performance standards for the energy efficiency of buildings through the Building Code of Australia (BCA) Volume 1, Section J. To enable flexibility in the architectural design of the building, a Performance Solution has been used to comply with the Performance Requirement - JIP1.

The performance solution method is a combination of verification method JIV3 facilitated for part J4 (building fabric) and a Deemed-to-Satisfy (DtS) comparison for parts J5 (building sealing) and J6 -J9 (building services). The Assessment Method, 'JIV3 Verification using a reference building' has been used and is an Alternative Solution for the Building Fabric only. As such, a Proposed Building with the proposed fabric has been modelled as part of this approach, to compare against the Reference Building services.

## Project Inputs

The proposed school building is part of the stage 1 works of the ACC Casey Development project as is in NCC Climate zone 6 and is classified as a Class 9b – School building based on NCC building classification.

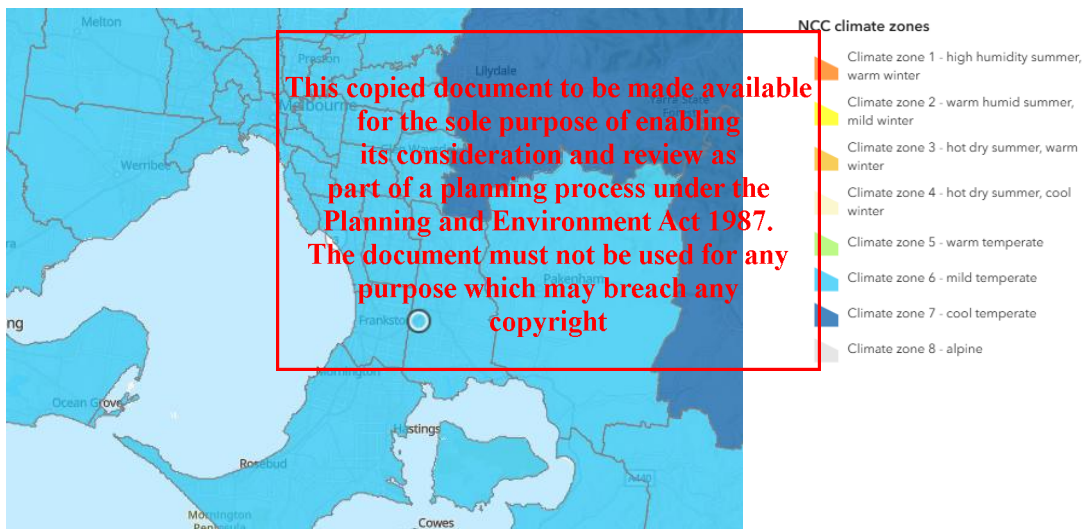


Figure 1 NCC Climate zone map of the proposed building falling in climate zone 6.

## Thermal Envelope Description

The external façade of the building is considered as the thermal envelope for this assessment which includes the roofs, walls and floors (ground and external).

Table 1 Proposed floor area of the building forming a part of the thermal envelope.

Description	Building Classification	Floor Area
Ground Floor	Class 9b (School)	1841 m <sup>2</sup>
First Floor	Class 9b (School)	1841 m <sup>2</sup>
Second Floor	Class 9b (School)	1841 m <sup>2</sup>
<b>Total Floor Area (m<sup>2</sup>)</b>		<b>5523 m<sup>2</sup></b>

# Proposed Building Specifications

## J4 – Building Fabric

The thermal performance of all elements comprising the building envelope has been calculated in the sections below.

### J4D4 – Roof and ceiling construction

Total system R-values of all roofs including the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (as per J4D3 Thermal Construction – General (5)) or are stated values.

Outer solar absorptance: 0.45 or similar

#### Pitched Roof with suspended ceiling

Table 2 Total R-value layer breakdown of Pitched Roof with suspended ceiling construction

Material Layer Description	In-situ material Thickness (in mm)	Emittance		Total R-value (m <sup>2</sup> .K/W)
		Out	In	
External Air Film				0.04
External steel sheet				0
R1.3 Roof Blanket (Compressed) (Foil facing down)	50	0.9	0.05	1.0
Reflective air space (created by the roof blanket)	500			Combined below
R2.0 Ceiling Insulation Batts [Bridged by joists]	75			1.84
Plasterboard Ceiling Lining	13			0.08
Internal Air Film				0.16
<b>Total R-value (m<sup>2</sup>.K/W)</b>				<b>3.12</b>
Roof and ceiling constructions minimum DTS requirement is <b>R3.12</b> m <sup>2</sup> .K/W.				

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Roof Top Hat/ spacer: 50mm @ 250mm CTRS

Bridging member: 152mm x 64mm x 1.5mm BMT Ceiling joists @ 400mm CTRS

### J4D6 – Walls and glazing

#### Walls

Total System R-values of all walls include the effects of thermal bridging, which are calculated in accordance with AS/NZS 4859.2 and NZ 4214:2006 (as per J4D3 Thermal Construction – General (5)) or are stated values.

Outer solar absorptance: 0.60 or similar

## External Steel Cladded Wall

Table 3 Total R-value layer breakdown of external steel wall construction

Material Layer Description	In-situ material Thickness (in mm)	Emittance		Total R-value (m <sup>2</sup> .K/W)
		Out	In	
External air film				0.01
External steel cladding				0
Bridged air cavity with permeable membrane [Reflective]	35	0.9	0.05	Combined below
R2.0 Insulation batts [Bridged by batts]	90			1.1
Plasterboard wall lining	13			0.08
Internal air film				0.12
<b>Total R-value (m<sup>2</sup>.K/W)</b>				<b>1.31</b>

Wall constructions minimum DTS requirement is **R1.31** m<sup>2</sup>.K/W.

Bridging member: 90mm x 42mm x 0.7mm BMT wall studs @ 600mm CTRS

## External Fibre cement Cladded Wall

Table 4 Total R-value layer breakdown of external fibre cement wall construction

Material Layer Description	In-situ material Thickness (in mm)	Emittance		Total R-value (m <sup>2</sup> .K/W)
		Out	In	
External air film				0.01
External fibre cement cladding	9			0.01
Bridged air cavity with permeable membrane [Reflective]	35	0.9	0.05	Combined below
R2.0 Insulation batts [Bridged by batts]	90			1.2
Plasterboard wall lining	13			0.08
Internal air film				0.12
<b>Total R-value (m<sup>2</sup>.K/W)</b>				<b>1.43</b>

Wall constructions minimum DTS requirement is **R1.43** m<sup>2</sup>.K/W.

Bridging member: 90mm x 42mm x 0.7mm BMT wall studs @ 600mm CTRS

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## Glazing

Total system U-values of all windows include the effects of thermal bridging at the frame, which are calculated in accordance with ISO 15099, as per J4D3 Thermal Construction – General (5).

All external glazing within the building envelope must meet or be better than the values indicated in the calculations below to achieve compliance. The values below are the total thermal performance of the glazing (i.e., frame and glazing combination).

Table 5 Total system U-value and SHGC of all external glazing

Glazing Type	Description	Total System U-value	SHGC
External facade glazing	Double glazed window	4.0	0.40

Note: These proposed minimum values are derived from thermal modelling based on the JIV3 Verification method. The DTS glazing values applied in the reference building simulation will be found in the Appendix.

## J4D7 – Floors

Total system R-values of all floors include the effects of thermal bridging are calculated in accordance with AS/NZS 4859.2, NZ 4214:2006 and Section 3.5 of CIBSE Guide A (as per J4D3 Thermal Construction – General (5)) or are stated values

### Suspended ground floor

Table 6 Total R-value layer breakdown of suspended floor construction

Material Layer Description	In-situ material thickness (in mm)	Emittance		Total R-value (m <sup>2</sup> K/W)
		Out	In	
Internal air film				0.16
5mm floor covering + 19mm floor lining	24			0.13
Bridged air cavity (enclosed)	150			0.8
Internal steel pan				0
<b>Total R-value (m<sup>2</sup>.K/W)</b>				<b>1.0</b>

Floor constructions minimum DTS requirement is **R1.0** m<sup>2</sup>.K/W.

Bridging member: 150mm x 50mm x 1.0mm BMT floor joists @ 450mm CTRS

## Non-Envelope Building Fabric Construction

The non-envelope fabrics have been modelled with the thermal performance as listed below.

Table 7 Total R-value layer breakdown of non-envelope fabric construction

Type	Description	Total System U-value
Internal partition	10mm Plasterboard lining on both sides with nil insulation	0.89
Internal floor	Nil insulation	1.0

## J5 – Building Sealing

The following requirements apply to the parts of the building forming the building envelope.

### J5D2 Application of Part

This requirement does not apply to this building.

### J5D5 Windows and Doors

All doors, openable windows or the like must be sealed when forming a part of the envelope in accordance with section J5D5(1).

Any edges of a door, an openable window or any such opening must be sealed to restrict air infiltration with a draft protection device, foam or rubber compression strip or the like to achieve compliance in accordance with section J5D5(3).

All entrances to the building, where the conditioned area has a floor area of 50m<sup>2</sup> or more must have an airlock, self-closing door, rapid roller door, revolving door or the like to achieve compliance in accordance with section J5D5(4).

### J5D7 Construction of Ceilings, Walls and Floors

Any construction of ceilings, walls and floors and any openings must be constructed to minimise air leakage such as close fitted and sealed at junctions such as skirting or cornice, rubber compression strip or the like to achieve compliance in accordance with section J5D7(1-2).

## J6 – Air Conditioning and Ventilation Systems

### J6D3 – Airconditioning System Control

Air conditioning system control must comply with J6D3(1)(a).

### J6D4 – Mechanical Ventilation System Control

Mechanical ventilation system control must comply with J6D4(1)(a), J6D4(1)(b)(A), J6D4(1)(b)(B), J6D4(4)(a), J6D4(4)(b).

### J6D6 – Ductwork Insulation

Ductwork insulation must comply with J6D6(1), J6D6(2).

## J7 – Artificial Lighting and Power

### J7D3 – Artificial Lighting

There are artificial lights specified. The compliant lighting calculations define maximum DtS allowance and proposed lighting must not exceed the total power load allowance as specified below.

Table 8 Maximum Illumination Power Load Allowance by levels

Level	Maximum Illumination Power Load allowance (W)
Ground Floor	9,533
First Floor	8,729
Second Floor	9,609

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#### **J7D4 - Interior Artificial Lighting and Power Control**

J7D4(1) Artificial lighting within a room or space must be controlled by a switch and or control device.

J7D4(3) Artificial lighting within a room (or space) must be controlled by a switch and or control device in the same or adjacent room (or space).

J7D4(4) 95% of the light fittings in a building or storey of more than 250m<sup>2</sup>, must be controlled by a time switch or occupant sensing device. Operation in accordance with Specification J7 is required for time switching and motion detectors provided as occupant sensing devices.

J7D4(5) Artificial lighting must be separately controlled from artificial lighting not in a natural lighting zone in the same storey as per the requirement of J7D4(5).

#### **J7D5 - Interior Decorative and Display Lighting**

Interior decorative and display lighting (including window display lighting, if present) must be controlled as per the requirement of J7D5.

#### **J7D6 - Exterior Artificial Lighting**

External artificial lighting will likely exceed 100W.

J7D6(1)(a)(B) Exterior artificial lighting must be controlled by either a daylight sensor or time switch as per the requirements of J7D6(1)(a)(B).

J7D6(1)(b) Exterior artificial lighting load exceeding 100W must either use LED luminaires for 90% of the total lighting or be controlled by a motion detector in accordance with Specification J6. to comply with this section.

#### **J7D7 - Boiling Water and Chilled Water Storage Units**

J7D7 Power supply to a boiling water or chilled water storage unit (if present) must be controlled by a time switch in accordance with specification J7.

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# Reference Building Specifications

As per specification 34 – Modelling Parameters of the NCC 2022 Volume 1, the reference building must comply with the Deemed-to-satisfy provisions specified in Section J, part J4 – J9.

## Reference Building Fabric

The reference building fabrics modelled meets the minimum requirements as specified in part J4 (sections J4D4 – J4D7) of the code and has been referenced below.

The building’s glazing requirements were calculated using the NCC 2022 Volume One Facade Calculator. There are 2 methods of glazing performance requirements where, method 1 shows the glazing requirement based on all four orientations and method 2 combines all four orientations to provide one glazing performance requirement.

Table 9 Reference Building construction specification

Element	Solar Absorbance	Total R-value (m <sup>2</sup> .k/W)	
Roof Construction	0.45	3.2	
Wall Construction	0.60	1.4	
Floor Construction	-	2.0	
	Orientation	Glazing U-value (W/m <sup>2</sup> .K)	SHGC
Method 1 Glazing (all orientations)	North	4.80	0.41
	East	4.77	0.41
	South	4.80	0.41
	West	3.78	0.31

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## Reference Building Services

### HVAC Systems

As per the Specification 34 of the NCC 2022 Volume 1 code, HVAC systems must be MEPS compliant when not covered by parts J6 – J8. With reference to the Minimum Energy Performance Standards (MEPS) the relevant COP data specified below has been derived based on the ducted HVAC system standards.

MEPS Heating Coefficient of Performance (COP): 3.1

MEPS Cooling Energy Efficiency Ratio (EER): 3.1

Heating & Cooling Fuel: Electricity

### Artificial Lighting Systems

As per specification 34 of the NCC 2022 Volume 1 code, the artificial lighting must achieve the required maximum illumination power density in part J7 with applying the adjustment factors. The table below lists the relevant values based on the activity of each zone referenced from table J7D3a – Maximum Illumination power density.

Table 10 Maximum Illumination Power Density used for reference building artificial lighting

Zone	Maximum Illumination Power density (W/m <sup>2</sup> )
School – general purpose learning areas and tutorial rooms	4.5
Toilet, Locker room, staff room, rest room and the like	3
Corridors	5
Stairways	2
Office	4.5
Board room and conference room	5
Library – reading room and general areas	4.5

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# Standard Modelling Inputs

This section lists the standard modelling inputs used while modelling that are relative to the building class and meets the requirements of Section 34 modelling parameters and specification 35 Modelling profiles for JIV3 assessment.

Table 11 Fixed inputs in the model

Input	Specification
<b>Modelling Inputs:</b>	
Weather file	AUS_VIC_Cranbourne.Botanic.Gardens.948790_TMYx.2007-2021
External Shading	As per the Architectural drawing set
Space Temperature Range	21°C - 24°C for 98% of annual occupancy hours.
Infiltration Rate	0.7 ac/hr - No supplied air; 0.35 ac/h to mechanically ventilated zones.
<b>Internal Loads:</b>	
Occupancy and Operation Profiles	As per Table S35C2j, Specification 35 Modelling profiles
Occupant Density	As per Table D2D18 Area per person (Office) - 2m <sup>2</sup>
Internal heat gains from appliances & equipment	As per Table S35C2l, Specification 35 Modelling profiles - 5 W/m <sup>2</sup>
Internal heat gains for occupants and hot meals	As per Table S35C2n, Specification 35 Modelling profiles - 75 W (sensible heat gain) and 55W (Latent heat gain)
Hot water supply	As per Table S35C2m, Specification 35 Modelling profiles - 7 L/person
<b>Building level activity settings</b>	
Winter clothing level (CLO factor):	1
Summer clothing level (CLO factor):	0.5
Metabolic rate	School
Comfort radiant temperature weighting	1 - Zone averaged

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# Building Simulation Results

To meet compliance, the annual Greenhouse Gas Emissions of the proposed building must be less than 25.33 kgCO<sub>2</sub>-e/m<sup>2</sup>. Based on the total floor area of 5,523 m<sup>2</sup>, the proposed building achieved 21.29 kgCO<sub>2</sub>-e/m<sup>2</sup>, meeting the compliance requirements. The table below for detailed energy performance results for both the proposed and reference building to compare the results.

Table 12 Building simulation results

Energy Use Components	Proposed Building (with reference services) (In KgCO <sub>2</sub> e/m <sup>2</sup> )	Reference Building with reference services (In KgCO <sub>2</sub> e/m <sup>2</sup> )
Cooling Electricity	10.9	12.0
Heating Electricity	2.3	3.5
Fans Electricity	8.1	9.9
<b>Total Annual GHG Emissions (KgCO<sub>2</sub>e/m<sup>2</sup>)</b>	<b>21.3</b>	<b>25.3</b>

Note: Not every Energy Use Component listed in Section J is included in the above table as certain energy consumption components may have been evaluated in accordance with DTS criteria or by other experts since compliance has been approached as a Performance Solution.

## Operational Energy Reduction

A 16.6% reduction in heating, cooling and ventilation energy loads have been achieved from the reference building.

Proposed Building (kWh/annum)	Reference Building (kWh/annum)
139,311	117,065

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Note: These results only include energy usage from heating, cooling and ventilation loads and does not include other loads such as lighting or plug-loads.

## Thermal Comfort Results

To achieve compliance, 95 % of total area across the assessed zones must meet the conditions:

- zone thermal comfort (PMV) is between -1.0 and 1.0 PMV
- for at least 98 % of hours
- when above 20 % occupancy

A total area of 5,523 m<sup>2</sup> across 76 zones were assessed, where zones of **97.80 %** area achieved the conditions, meeting the thermal comfort compliance. The table below for detailed results within each zone.

Table 13 Thermal comfort results per zone

Zone	Assessed (Hrs)	Pass (Hrs)	PMV %
1. GLA 2	3,235	3,235	100

2. GLA 7	3,235	3,217	99.44
3. GLA 11	3,235	3,220	99.54
4. GLA 10	3,235	3,227	99.75
5. GLA 8	3,235	3,228	99.78
6. Learning Support	3,235	3,234	99.97
7. Office	3,235	3,216	99.41
8. Office	3,235	3,216	99.41
9. Office	3,235	3,222	99.6
10. Office	3,235	3,234	99.97
11. GLA 9	3,235	3,228	99.78
12. Office	3,235	3,235	100
13. Kitchen & print	3,235	3,235	100
14. GLA 3	3,235	3,235	100
15. GLA 4	3,235	3,235	100
16. Kitchenette	3,235	3,234	99.97
17. GLA 5	3,235	3,235	100
18. GLA 6	3,235	3,235	100
19. GLA 1	3,235	3,235	99.94
20. Meeting	3,235	3,234	99.97
21. Office	3,235	3,235	100
22. Admin	3,235	3,235	100
23. GLA 18	3,235	3,229	99.81
24. GLA 17	3,235	3,229	99.81
25. Library	3,235	3,231	99.88
26. Staff Room	3,235	3,222	99.6
27. GLA 20	3,235	3,220	99.54
28. GLA 16	3,235	3,235	100
29. GLA 19	3,235	3,229	99.81
30. GLA 15	3,235	3,235	100
31. GLA 14	3,235	3,235	100
32. GLA 13	3,235	3,235	100
33. GLA 12	3,235	3,235	100
34. Science Room	3,235	3,174	98.11
35. GLA 27	3,235	3,233	99.94
36. Science Prep	3,235	3,186	98.49
37. Science Room	3,235	3,200	98.92
38. GLA 21	3,235	3,227	99.75

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39. GLA 29	3,235	3,158	97.62
40. GLA 25	3,235	3,233	99.94
41. GLA 28	3,235	3,201	98.95
42. GLA 26	3,235	3,233	99.94
43. GLA 24	3,235	3,233	99.94
44. GLA 23	3,235	3,233	99.94
45. GLA 22	3,235	3,233	99.94
46. GLA 28	3,235	3,201	98.95
<b>Overall Result</b>			<b>97.80</b>

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# Appendices

## Appendix 1 – Façade Calculator

Façade

Wall Glazing Areas + Results
Calculator

Results
Class 9b - schools
Climate Zone 6 - Mild temperate

### Wall Glazing Area

Compliant Solution =  
Non-Compliant Solution =

North	Glazing Reference	Height (m)	Width (m)	Glazing Area (m <sup>2</sup> )	Shading Reference	Wall Reference	Wall Area (m <sup>2</sup> )	Total Area (m <sup>2</sup> )	Internal
1	W1	21.6	10	216		North Wall 1	469.32	685.32	<input type="checkbox"/>
2									<input type="checkbox"/>
3									<input type="checkbox"/>
4									<input type="checkbox"/>
5									<input type="checkbox"/>
6									<input type="checkbox"/>
		<b>Result</b>		<b>Target</b>					
		Wall-glazing U-Value (W/m <sup>2</sup> .K)		0.43		2.00			
		Solar Admittance							
				Glazing Area (m <sup>2</sup> )		216		Average Glazing U-Value (W/m <sup>2</sup> .K)	
				Wall Area (m <sup>2</sup> )		469.32		Average Glazing SHGC	
				Glazing to Façade Ratio		31%		Average Wall R-Value (m <sup>2</sup> .KW)	
								0.00	
								1.40	

East	Glazing Reference	Height (m)	Width (m)	Glazing Area (m <sup>2</sup> )	Shading Reference	Wall Reference	Wall Area (m <sup>2</sup> )	Total Area (m <sup>2</sup> )	Internal
1	W1	11.4	10	114		East Wall 1	245.3	359.30	<input type="checkbox"/>
2									<input type="checkbox"/>
3									<input type="checkbox"/>
4									<input type="checkbox"/>
5									<input type="checkbox"/>
6									<input type="checkbox"/>
		<b>Result</b>		<b>Target</b>					
		Wall-glazing U-Value (W/m <sup>2</sup> .K)		0.43		2.00			
		Solar Admittance							
				Glazing Area (m <sup>2</sup> )		114		Average Glazing U-Value (W/m <sup>2</sup> .K)	
				Wall Area (m <sup>2</sup> )		245.3		Average Glazing SHGC	
				Glazing to Façade Ratio		32%		Average Wall R-Value (m <sup>2</sup> .KW)	
								0.00	
								1.40	

South	Glazing Reference	Height (m)	Width (m)	Glazing Area (m <sup>2</sup> )	Shading Reference	Wall Reference	Wall Area (m <sup>2</sup> )	Total Area (m <sup>2</sup> )	Internal
1	W1	21.6	10	216		South Wall 1	469.32	685.32	<input type="checkbox"/>
2									<input type="checkbox"/>
3									<input type="checkbox"/>
4									<input type="checkbox"/>
5									<input type="checkbox"/>
6									<input type="checkbox"/>
		<b>Result</b>		<b>Target</b>					
		Wall-glazing U-Value (W/m <sup>2</sup> .K)		0.43		2.00			
		Solar Admittance							
				Glazing Area (m <sup>2</sup> )		216		Average Glazing U-Value (W/m <sup>2</sup> .K)	
				Wall Area (m <sup>2</sup> )		469.32		Average Glazing SHGC	
				Glazing to Façade Ratio		31%		Average Wall R-Value (m <sup>2</sup> .KW)	
								0.00	
								1.40	

West	Glazing Reference	Height (m)	Width (m)	Glazing Area (m <sup>2</sup> )	Shading Reference	Wall Reference	Wall Area (m <sup>2</sup> )	Total Area (m <sup>2</sup> )	Internal
1	W1	15.05	10	150.5		West Wall 1	208.5	359.00	<input type="checkbox"/>
2									<input type="checkbox"/>
3									<input type="checkbox"/>
4									<input type="checkbox"/>
5									<input type="checkbox"/>
6									<input type="checkbox"/>
		<b>Result</b>		<b>Target</b>					
		Wall-glazing U-Value (W/m <sup>2</sup> .K)		0.41		2.00			
		Solar Admittance							
				Glazing Area (m <sup>2</sup> )		150.5		Average Glazing U-Value (W/m <sup>2</sup> .K)	
				Wall Area (m <sup>2</sup> )		208.5		Average Glazing SHGC	
				Glazing to Façade Ratio		42%		Average Wall R-Value (m <sup>2</sup> .KW)	
								0.00	
								1.40	

### Reference Building

Include shading?

	Glazing to Façade Ratio	Wall U-Value (W/m <sup>2</sup> .K)	Method 1 Glazing U-Value (W/m <sup>2</sup> .K)	Shading Multiplier	SHGC	Wall U-Value (W/m <sup>2</sup> .K)	Method 2 Glazing U-Value (W/m <sup>2</sup> .K)	SHGC
North	31%	0.71	4.80	1.000	0.41	0.71	4.57	0.39
East	32%	0.71	4.77	1.000	0.41			
South	31%	0.71	4.80	1.000	0.41			
West	42%	0.71	3.78	1.000	0.31			

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## Appendix 2 – Lighting Calculator

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# Non-residential Lighting





**Calculator**

Building name/description
ACC Casey 271-275 Pearcedale Rd, Cranbourne South - Ground Floor
Number of rows preferred in table below <span style="margin-left: 20px;">29</span> <small>(as currently displayed)</small>

Classification
Class 9b

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design illumination power load	Space	Illuminance		Adjustment factor 1			Adjustment factor 2			Light colour adjustment factors		SATISFIES PART J7D3	
							Designed lux level	Recommended lux level	Adjustment factor 1	Dimming % area	Illuminance turndown	Adjustment factor 2	Dimming % area	Illuminance turndown	Light colour adjustment factor 1	Light colour adjustment factor 2	System illumination power load allowance	Lighting system share of % of aggregate allowance used
1	GLA 3-6	91.5 m <sup>2</sup>	38 m	2.7 m	522 W	School - general purpose learning areas and tutorial rooms											522 W	5% of 99%
2	Office	12.6 m <sup>2</sup>	15 m	2.7 m	92 W	Office - artificially lit to an ambient level of 200 lx or more											92 W	1% of 99%
3	Office	6.8 m <sup>2</sup>	10 m	2.7 m	53 W	Office - artificially lit to an ambient level of 200 lx or more											53 W	1% of 99%
4	Office	7.4 m <sup>2</sup>	11 m	2.7 m	57 W	Office - artificially lit to an ambient level of 200 lx or more											57 W	1% of 99%
5	Learning Support	18.4 m <sup>2</sup>	22 m	2.7 m	153 W	Corridors											153 W	2% of 99%
6	Kitchenette	7.7 m <sup>2</sup>	11 m	2.7 m	40 W	Toilet, locker room, staff room, rest room and the like											40 W	0% of 99%
7	Staff AWC	5.8 m <sup>2</sup>	10 m	2.7 m	30 W	Toilet, locker room, staff room, rest room and the like											30 W	0% of 99%
8	GLA 3-6	89.5 m <sup>2</sup>	38 m	2.7 m	510 W	School - general purpose learning areas and tutorial rooms											510 W	5% of 99%
9	GLA 3-6	89.5 m <sup>2</sup>	38 m	2.7 m	510 W	School - general purpose learning areas and tutorial rooms											510 W	5% of 99%
10	Student Toilets	40.7 m <sup>2</sup>	32 m	2.7 m	185 W	Toilet, locker room, staff room, rest room and the like											185 W	2% of 99%
11	AWC Shwr	9.6 m <sup>2</sup>	13 m	2.7 m	49 W	Toilet, locker room, staff room, rest room and the like											49 W	1% of 99%
12	Cleaner	5.9 m <sup>2</sup>	10 m	2.7 m	16 W	Service area, cleaner's room and the like											16 W	0% of 99%
13	GLA K-2	89.7 m <sup>2</sup>	38 m	2.7 m	510 W	School - general purpose learning areas and tutorial rooms											510 W	5% of 99%
14	GLA K-2	92.4 m <sup>2</sup>	39 m	2.7 m	527 W	School - general purpose learning areas and tutorial rooms											527 W	6% of 99%
15	FLA	498.2 m <sup>2</sup>	135 m	2.7 m	2595 W	Corridors											2595 W	27% of 99%
16	Meeting	19.1 m <sup>2</sup>	18 m	2.7 m	137 W	Office - artificially lit to an ambient level of 200 lx or more											137 W	1% of 99%
17	Kitchenette	4.1 m <sup>2</sup>	8 m	2.7 m	21 W	Toilet, locker room, staff room, rest room and the like											21 W	0% of 99%
18	Print/ store	7.7 m <sup>2</sup>	11 m	2.7 m	29 W	Toilet, locker room, staff room, rest room and the like											39 W	0% of 99%
19	Admin	31.3 m <sup>2</sup>	26 m	2.7 m	217 W	Office - artificially lit to an ambient level of 200 lx or more											217 W	2% of 99%
20	Office	11.4 m <sup>2</sup>	14 m	2.7 m	85 W	Office - artificially lit to an ambient level of 200 lx or more											85 W	1% of 99%
21	Office	7.6 m <sup>2</sup>	11 m	2.7 m	59 W	Office - artificially lit to an ambient level of 200 lx or more											59 W	1% of 99%
22	Office	8.4 m <sup>2</sup>	12 m	2.7 m	64 W	Office - artificially lit to an ambient level of 200 lx or more											64 W	1% of 99%
23	GLA K-2	89.1 m <sup>2</sup>	38 m	2.7 m	508 W	School - general purpose learning areas and tutorial rooms											508 W	5% of 99%
24	GLA K-2	89.1 m <sup>2</sup>	38 m	2.7 m	508 W	School - general purpose learning areas and tutorial rooms											508 W	5% of 99%
25	GLA K-2	89.1 m <sup>2</sup>	38 m	2.7 m	508 W	School - general purpose learning areas and tutorial rooms											508 W	5% of 99%
26	GLA K-2	89.1 m <sup>2</sup>	38 m	2.7 m	508 W	School - general purpose learning areas and tutorial rooms											508 W	5% of 99%
27	GLA 3-6	89.1 m <sup>2</sup>	38 m	2.7 m	508 W	School - general purpose learning areas and tutorial rooms											508 W	5% of 99%

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# Non-residential Lighting





**Calculator**

**Building name/description**  
ACC Casey\_ 271-275 Pearcedale Rd, Cranbourne South - Ground Floor


**Classification**  
Class 9b

Number of rows preferred in table below: 29 (as currently displayed)


ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design illumination power load	Space	Illuminance		Adjustment factor 1			Adjustment factor 2			Light colour adjustment factors		SATISFIES PART J7D3	
							Designed lux level	Recommended lux level	Adjustment factor 1	Dimming % area	Illuminance turndown	Adjustment factor 2	Dimming % area	Illuminance turndown	Light colour adjustment factor 1	Light colour adjustment factor 2	System illumination power load allowance	Lighting system share of % of aggregate allowance used
28	GLA 3-6	91.5 m <sup>2</sup>	39 m	2.7 m	522 W	School - general purpose learning areas and tutorial rooms											522 W	5% of 99%
29																		

**Total** 9523 W

**Total** 9533 W

if inputs are valid 

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# Non-residential Lighting



Calculator

**Building name/description**  
 ACC Casey\_ 271-275 Pearce Dale Rd, Cranbourne South - First Floor

**Number of rows preferred in table below**    19 *(as currently displayed)*

**Classification**  
 Class 9b

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design illumination power load	Space	Illuminance		Adjustment factor 1			Adjustment factor 2			Light colour adjustment factors		SATISFIES PART J7D3	
							Designed lux level	Recommended lux level	Adjustment factor 1	Dimming % area	Illuminance turndown	Adjustment factor 2	Dimming % area	Illuminance turndown	Light colour adjustment factor 1	Light colour adjustment factor 2	System illumination power load allowance	Lighting system share of % of aggregate allowance used
1	Staff Room	123.1 m <sup>2</sup>	45 m	2.7 m	439 W	Toilet, locker room, staff room, rest room and the like											439 W	5% of 100%
2	Staff Toilets	20.9 m <sup>2</sup>	27 m	2.7 m	105 W	Toilet, locker room, staff room, rest room and the like											105 W	1% of 100%
3	WC	3.8 m <sup>2</sup>	8 m	2.7 m	20 W	Toilet, locker room, staff room, rest room and the like											20 W	0% of 100%
4	Amb	3.7 m <sup>2</sup>	8 m	2.7 m	20 W	Toilet, locker room, staff room, rest room and the like											20 W	0% of 100%
5	AWC	6.3 m <sup>2</sup>	10 m	2.7 m	33 W	Toilet, locker room, staff room, rest room and the like											33 W	0% of 100%
6	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
7	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
8	Student Toilets	40.0 m <sup>2</sup>	32 m	2.7 m	277 W	School - general purpose learning areas and tutorial rooms											277 W	3% of 100%
9	Cleaner	5.9 m <sup>2</sup>	10 m	2.7 m	46 W	School - general purpose learning areas and tutorial rooms											46 W	1% of 100%
10	AWC/ Shwr	9.6 m <sup>2</sup>	13 m	2.7 m	49 W	Toilet, locker room, staff room, rest room and the like											49 W	1% of 100%
11	GLA	88.8 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
12	GLA	88.8 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
13	FLA	432.2 m <sup>2</sup>	116 m	2.7 m	2251 W	Corridors											2251 W	26% of 100%
14	GLA	91.8 m <sup>2</sup>	39 m	2.7 m	523 W	School - general purpose learning areas and tutorial rooms											523 W	6% of 100%
15	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
16	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
17	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
18	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms											506 W	6% of 100%
19	Library	181.6 m <sup>2</sup>	58 m	2.7 m	918 W	Library - reading room and general areas											918 W	11% of 100%

**Total**    8729 W

**Total**    8729 W

*if inputs are valid*



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# Non-residential Lighting





**Calculator**

**Building name/description**  
 ACC Casey\_ 271-275 Pearcedale Rd, Cranbourne South - Second Floor


**Classification**  
 Class 9b

Number of rows preferred in table below: **21** (as currently displayed)

ID	Description	Floor area of the space	Perimeter of the space	Floor to ceiling height	Design illumination power load	Space	Illuminance		Adjustment factor 1			Adjustment factor 2			Light colour adjustment factors		SATISFIES PART J7D3	
							Designed lux level	Recommended lux level	Adjustment factor 1	Dimming % area	Illuminance turndown	Adjustment factor 2	Dimming % area	Illuminance turndown	Light colour adjustment factor 1	Light colour adjustment factor 2	System illumination power load allowance	Lighting system share of % of aggregate allowance used
1	Science Room	91.7 m <sup>2</sup>	39 m	2.7 m	523 W	School - general purpose learning areas and tutorial rooms										523 W	5% of 100%	
2	Science Prep	41.0 m <sup>2</sup>	27 m	2.7 m	268 W	School - general purpose learning areas and tutorial rooms										268 W	3% of 100%	
3	Toilets	25.4 m <sup>2</sup>	20 m	2.7 m	117 W	Toilet, locker room, staff room, rest room and the like										117 W	1% of 100%	
4	Stairway 1	18.8 m <sup>2</sup>	17 m	2.7 m	60 W	Stairways, including fire-isolated stairways										60 W	1% of 100%	
5	Science Room	88.7 m <sup>2</sup>	38 m	2.7 m	505 W	School - general purpose learning areas and tutorial rooms										505 W	5% of 100%	
6	GLA	89.0 m <sup>2</sup>	38 m	2.7 m	508 W	School - general purpose learning areas and tutorial rooms										508 W	5% of 100%	
7	Student Toilets	40.6 m <sup>2</sup>	32 m	2.7 m	185 W	Toilet, locker room, staff room, rest room and the like										185 W	2% of 100%	
8	Cleaner	5.9 m <sup>2</sup>	10 m	2.7 m	16 W	Service area, cleaner's room and the like										16 W	0% of 100%	
9	AWC/ Shwr	9.6 m <sup>2</sup>	13 m	2.7 m	49 W	Toilet, locker room, staff room, rest room and the like										49 W	1% of 100%	
10	GLA	89.4 m <sup>2</sup>	38 m	2.7 m	509 W	School - general purpose learning areas and tutorial rooms										509 W	5% of 100%	
11	GLA	90.9 m <sup>2</sup>	38 m	2.7 m	518 W	School - general purpose learning areas and tutorial rooms										518 W	5% of 100%	
12	FLA	429.7 m <sup>2</sup>	114 m	2.7 m	2214 W	Corridors										2214 W	23% of 100%	
13	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
14	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
15	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
16	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
17	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
18	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
19	GLA	88.9 m <sup>2</sup>	38 m	2.7 m	506 W	School - general purpose learning areas and tutorial rooms										506 W	5% of 100%	
20	GLA	91.8 m <sup>2</sup>	39 m	2.7 m	523 W	School - general purpose learning areas and tutorial rooms										523 W	5% of 100%	
21	Stairway 2	18.8 m <sup>2</sup>	17 m	10.8 m	72 W	Stairways, including fire-isolated stairways										72 W	1% of 100%	

**Total** 9609 W

**Total** 9609 W

if inputs are valid 

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