



## **SUSTAINABILITY MANAGEMENT PLAN (SMP)**

Proposed School Redevelopment

**17 Regal Avenue  
Thomastown**

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FOR

**CROSIER SCOTT ARCHITECTS**

18 June 2024

File 524A

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Issue	Date	Prepared by	Checked by	Status
A	11 June 2024	JD	MD	Draft
A	18 June 2024	JD	MD	Final

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## 1. EXECUTIVE SUMMARY

This Sustainability Management Plan (SMP) is intended to support the planning application.

A detailed sustainability review and assessment of the project has been undertaken in accordance with the Sustainable Design Assessment in the Planning Process (SDAPP). The following Key Sustainable Building Categories have been addressed:

1. Water Efficiency
2. Energy Efficiency
3. Stormwater Management
4. Indoor Environment Quality
5. Building Materials
6. Transport
7. Waste Management
8. Urban Ecology
9. Innovation
10. Construction & Building Management

The proposed school redevelopment will meet the Planning Scheme requirements for Whittlesea City Council. This will ensure an appropriate level of sustainability for the development and in doing so, will help manage environmental impact, create benefits for the urban realm and provide occupants with a good level of risk reduction against rising utility costs.

The development is within an area already well serviced by infrastructure (community etc.) and will also provide significant sustainability benefits such as the following:

- High efficiency hot water system (Heat Pump with high COP)
- Rainwater harvesting for toilet flushing and irrigation
- Efficient lighting and mechanical services.

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## 2. INTRODUCTION

Northern Environmental Design has been engaged by Crosier Scott Architects to identify and provide sustainability advice in relation to the proposed school redevelopment at 17 Regal Avenue Thomastown.

This report was based on plans provided by Crosier Scott Architects:

Drawing No.	Description	Revision	Date
A000	Cover sheet		May 2024
A001	Existing site conditions		May 2024
A002 -004	Proposed site plan		May 2024
A100	Proposed slab setout plan		May 2024
A102	Proposed floor and finished plan		May 2024
A103	Proposed ceiling and roof plan		May 2024
A105	Wall sections		May 2024
A106	Typical details		May 2024
A120-125	Proposed internal details		May 2024
A124	Proposed sections		May 2024
A125	Proposed elevations		May 2024
A130	Window and door schedule		May 2024
A105	Wall sections		May 2024
A200	Existing/Demolition plan		May 2024
A201	Proposed floor plan		May 2024
A202	Existing/Demolition ceiling plan		May 2024
A203	Proposed ceiling plan		May 2024
A204	Existing/Demolition & proposed roof plan		May 2024
A205	Existing/Demolition & proposed elevations		May 2024
A206	Proposed sections		May 2024
A220	Proposed internal elevation		May 2024
A230	Window and door schedule		May 2024

- Discussions and correspondence with:
  - Crosier Scott Architects

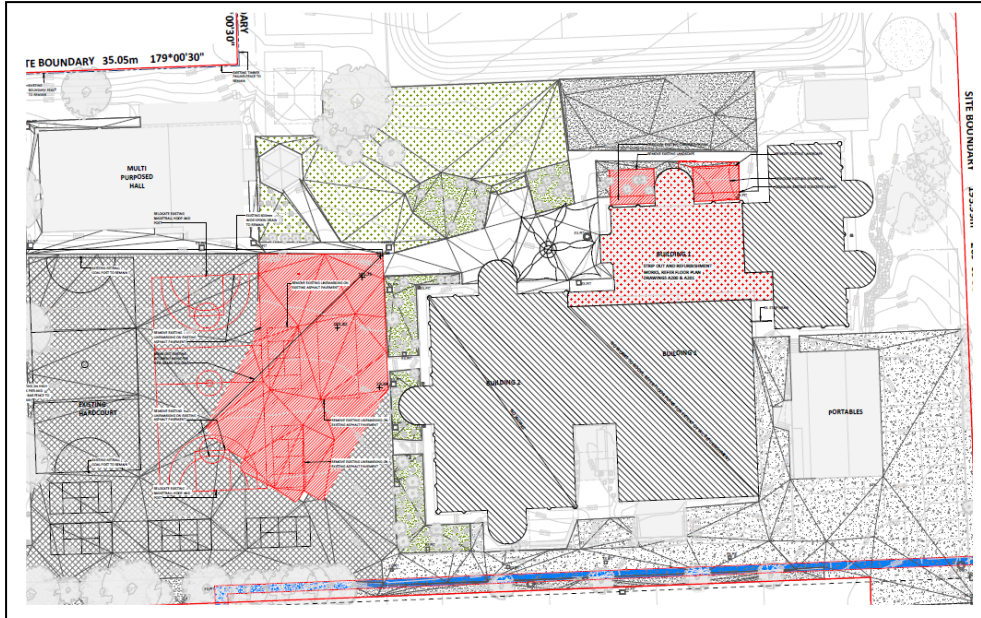
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## 2.1 Site Description

The allocated site for new administration building is approximately 600 m<sup>2</sup>. The development is located within Whittlesea City council.

A photo showing the location of the site and surrounding is presented below.



## 2.2 Building Constituents

The proposed redevelopment comprises of:

Level	Use
Ground floor	❖ A new administration building and school alteration (2 classrooms)

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### 3. KEY ESD INITIATIVES

The following key ESD initiatives have been incorporated into this project:

- Energy efficient lighting
- Efficient air conditioning
- Rainwater harvesting for toilet flushing and irrigation.
- Materials selections to be in accordance with ESD principles.

An assessment of sustainable design outcomes of the proposed development has been undertaken with BESS, STORM and NCC 2022 Façade Calculator benchmarking tools.

The BESS results are summarised below:

#### 3.1 BESS

BESS score for the development is showed below.



Please refer to Appendix 1 for details of the BESS results.

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## 4. ESD CATEGORIES

### 4.1 Water Efficiency

#### *Rainwater Harvesting*

Design Response/ Performance Commitments		Notes
Proposed rainwater collection and reuse system as detailed below:		<p><b>ADVERTISED PLAN</b></p>
<p><b>Collection area</b> Selected roof area of the new administration building</p>	<p><b>Tank Size</b> 5,000L</p>	
Re-use of water for toilet flushing and irrigation		

#### *Water Efficient Appliances*

Design Response/ Performance Commitments	Notes
Water efficient appliances (where appliances are provided by the developer) will be specified a minimum 3 WELS star.	This includes dishwashers and any other appliances using water.

#### *Water Efficient fittings*

Design Response/ Performance Commitments	Notes
<p>Water efficient fittings will be specified in accordance with the following minimum performance standard as rated by the Water Efficiency Labelling Scheme (WELS)</p> <ul style="list-style-type: none"> <li>❖ Toilets minimum 4-stars WELS rated</li> <li>❖ Tap minimum 5-stars WELS rated</li> <li>❖ Showers minimum 4-stars WELS rated (&gt;6L/min and &lt;= 7.5L/min)</li> <li>❖ Waterless urinals</li> </ul>	<p><b>This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright</b></p>

#### *Heat Rejection Water*

Design Response/ Performance Commitments	Notes
No air-conditioning systems in the building will rely on water-based heat rejection system, thereby avoiding the installation of potential water-consuming system.	



## 4.2 Energy Efficiency

### Building Design

Design Response/ Performance Commitments	Notes
<p>The following sustainable design features have been integrated into the design of the development:</p> <ul style="list-style-type: none"> <li>❖ Specification of high-performance glazing to reduce excessive summer heat gain and winter heat loss</li> </ul>	<p style="color: red; text-align: center;"><b>This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987.</b></p> <p style="color: red; text-align: center;"><b>The document must not be used for any purpose which may breach any copyright</b></p>

### Insulation

Design Response/ Performance Commitments	Notes
<p>All exposed floors and ceilings (forming part of the envelope) to meet the required NCC2022 insulation levels)</p>	<p><b>Walls: R 2.5</b> <b>Ceiling: R 5.0</b></p>

### Preliminary Wall Glazing Assessment

Design Response/ Performance Commitments	Notes
<p>The college meets the wall glazing energy efficiency requirements of NCC 2022 Part J4D6 based on the following window and wall specifications:</p> <p><u>Administration glazing</u> (Aluminium Single Glazed Low-E)</p> <ul style="list-style-type: none"> <li>• <b>U-Value: 5.6</b></li> <li>• <b>SHGC: 0.43</b></li> </ul> <p><u>School Alteration (classrooms) glazing</u> (Aluminium Single Glazed Low-E)</p> <ul style="list-style-type: none"> <li>• <b>U-Value: 5.0</b></li> <li>• <b>SHGC: 0.40</b></li> </ul>	<p>Note that the wall glazing construction must not be greater than the U-Value of U 2.0. The Total U - Value for both demonstrate a 10% reduction.</p> <p>Administration Building total U-Value achieved: <b>U 1.73</b></p> <p>School Alteration (classrooms) total U-Value achieved: <b>U 1.76</b></p> <p>Refer to <b>Appendix 3</b> for the NCC 2022 facade calculators.</p>

### Heating & Cooling

Design Response/ Performance Commitments	Notes
<p>Heating and cooling systems within one Star (3 star Heating and 3 star Cooling minimum), or Coefficient of Performance (CoP) &amp; Energy Efficiency Ratios (EER) 85% or better than the most efficient equivalent capacity unit)</p>	<p>Product listings and energy efficiency performance information is located at <a href="http://www.energyrating.gov.au">www.energyrating.gov.au</a></p>

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### Domestic Hot Water and Pool Water Heating

Design Response/ Performance Commitments	Notes
Domestic hot water will be provided by <ul style="list-style-type: none"> <li>Water heating system within one Star, or 85% or better than the most efficient equivalent capacity unit available (Heat Pump with COP of 3 minimum)</li> </ul>	

### Lighting

Design Response/ Performance Commitments	Notes
Energy efficient lighting systems will be installed throughout the development including: <ul style="list-style-type: none"> <li>❖ LED lighting to all internal rooms</li> <li>❖ LED external lighting.</li> </ul>	All common areas and external area lighting will be controlled through motion/daylight sensor. This will ensure that lighting only operates when adequate levels of daylight are insufficient or if human activity in common area does not exist. Lighting design to achieve the lighting power density requirements set out in Table J7D3a of the NCC 2022 Vol 1. Also external lighting will be designed to avoid light spill to the night sky.

## 4.3 Stormwater Management

### Stormwater Quality

Design Response/ Performance Commitments	Notes
The development achieves a STORM score of 105%.  Rainwater tanks connected to toilets is required to meet the STORM requirement.	The STORM score attained demonstrates that the development attains the Best Practice Standard for Urban Stormwater. Refer to Appendix 2 for the STORM report.

## 4.4 Indoor Environmental Quality

### Daylight Access

Design Response/ Performance Commitments	Notes
Majority of rooms have good access to natural daylight. The building form layout have been configured to ensure that building have either a north, east or west orientation and therefore receive direct solar access.	

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**Thermal comfort**

Design Response/ Performance Commitments	Notes
The use of performance glazing (Low-e glazing) together with the use of adequate insulation will maximise energy efficiency. High efficiency inverter drive air-conditioning units will also help in providing comfortable indoors.	<p style="color: red; text-align: center;"><b>This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright</b></p>
<b>Natural Ventilation</b>	
Design Response/ Performance Commitments	Notes
The development has access to natural ventilation. Majority of windows are operable and exceed NCC windows opening sizes requirement.	

**Volatile Organic Compounds**

Design Response/ Performance Commitments	Notes
All internal painted surfaces, adhesives and sealant will meet the Total Volatile Organic Compound (TVOC) Content.	Low VOC paints, sealant and adhesives will be specified in accordance with the VOC limits set out in the Indoor Pollutant Credit of the Green Star Design & As Built.

**4.5 Building Materials**

**Concrete**

Design Response/ Performance Commitments	Notes
Concrete used should be specified with the absolute amount of Portland cement across all concrete mixes, which at the same time will reduce embodied energy by substituting it with industrial waste product(s) or oversized aggregate as follows: <ul style="list-style-type: none"> <li>❖ 30% for in situ concrete</li> <li>❖ 20% for precast concrete</li> <li>❖ 10% for stressed concrete</li> <li>❖ Non-structural concrete will not use natural aggregate.</li> </ul>	<p>Note that this is subject to meeting structural requirements and project management constraints</p> <p style="color: red; text-align: center; font-size: 2em;"><b>ADVERTISED PLAN</b></p>

**Timber**

Design Response/ Performance Commitments	Notes
All timber used in the development will be recycled or from accredited sustainably harvested plantation sources (FSC or AFS)	Note that this is subject to meeting structural requirements and project management constraints

**Engineered Wood**

Design Response/ Performance Commitments	Notes
Engineered wood products include particleboard, plywood, Medium Density Fibreboard (MDF), Laminated Veneer Lumber (LVL), High-Pressure Laminate (HPL), Compact Laminate and decorative overlaid wood panels to meet the maximum total indoor pollutant emission limits. (Formaldehyde Limits <= 1mg/L)	

**Roof colour**

Design Response/ Performance Commitments	Notes
Roof colour (administration building) will be light to medium in colour with a Solar Absorptance (SA) equal to or less than 0.45.	

**Flooring**

Design Response/ Performance Commitments	Notes
Flooring will be selected from Ecospecifier or will have GECA or ISO14001 Certification	Carpet and flooring to meet the maximum total indoor pollutant emission limits (Total VOC < 0.5 mg/m2/hr).

**Paint, Sealant and Adhesives**

Design Response/ Performance Commitments	Notes
All internal painted surfaces, adhesives and sealant will meet the Total Volatile Organic Compound (TVOC) Content.	Low VOC paints, sealant and adhesives will be specified in accordance with the VOC limits set out in the Indoor Pollutant Credit of the Green Star Design & As Built.

**4.6 Sustainable Transport**

Design Response/ Performance Commitments	Notes
N/A	

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## 4.7 Waste Management

### Operational Waste Management

Design Response/ Performance Commitments	Notes
<p>The following waste management facilities will be provided in the development:</p> <p>Bins storage area will be provided to the proposed development.</p>	

### Construction Waste Minimisation

Design Response/ Performance Commitments	Notes
<p>A target recycling rate of 80% of construction and demolition waste has been adopted for the construction phase of the development to minimise the volume of waste to landfill.</p> <p>This will be achieved by the development of a comprehensive waste minimisation strategy including:</p> <ul style="list-style-type: none"> <li>❖ Separation of all commercially viable recyclable waste streams</li> <li>❖ Training in waste minimisation for all site staff and contractors to form part of site induction training.</li> <li>❖ Record keeping of landfill waste and recyclable stream volumes to track performance against the 80% recyclable target.</li> </ul>	<p>A dedicated recycling contractor will be engaged to facilitate separation of commercially viable recyclable waste streams in accordance with the target adopted.</p> <div style="border: 2px solid red; padding: 10px; text-align: center; color: red; font-weight: bold;"> <p>This copied document to be made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any copyright</p> </div>

## 4.8 Urban Ecology

### Landscape

Design Response/ Performance Commitments	Notes
<p>Landscaping has been integrated into the building design</p>	<p>This feature enhances the ecological value of the development.</p> <p>Note: Water efficient/drought tolerant plants will be selected</p>

## 4.9 Innovation

Design Response/ Performance Commitments	Notes
N/A	N/A

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## 4.10 Construction & Building Management

### Metering

Design Response/ Performance Commitments	Notes
<p>In addition, tenancy meters for utilities, the following meters will be installed to provide information in relation to centralised building systems and common area energy consumption:</p> <ul style="list-style-type: none"> <li>❖ Harvested rainwater supply line</li> <li>❖ External lighting meters</li> <li>❖ Power meter</li> <li>❖ Solar photovoltaic system</li> </ul>	<p>The information collected from these meters will be used by the Owner’s Corporation manager to assess the function and efficacy of central systems during commissioning and ongoing operation.</p>

### Commissioning & Maintenance

Design Response/ Performance Commitments	Notes
<p>All energy and water management systems set out in this report will be commissioned in accordance with the manufacturer’s specifications.</p> <p>Ongoing maintenance and regular monitoring of building systems will be undertaken by building management staff to ensure effective and efficient ongoing operation of all centralised building systems set out in this report including the rainwater harvesting system.</p>	

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## 5. IMPLEMENTATION STRATEGY

The ESD initiatives set out in this report will be coordinated by the Project Manager in conjunction with the following project design team members:

- Architect
- Project Manager.
- Thermal Performance Assessor/ESD consultant
- Building Services Consultant
- Builder
- Developer
- Waste Management Consultant

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An implementation schedule is set out in the following table:

ESD Initiative Implementation Schedule				
#	Initiative	Requirement	Responsibility	Stage
1	<b>Coordination of Initiatives</b>	Full implementation.	Project Manager	All
2	<b>Energy Assessment</b>	Part J assessment	Thermal Performance Assessor/ESD consultant	Design Development
3	<b>Heating &amp; Cooling</b>	Specification of units in accordance with nominated MEPS star ratings.	Building Services Engineer	Design Development
4	<b>Energy Efficient Appliances and pumps</b>	Specification of energy efficient appliances	Architect/ Developer	Design Development
5	<b>Lighting</b>	Specification of nominated energy efficient lighting types and automated controls.	Building Services Engineer	Design Development
6	<b>Domestic Hot Water Heating</b>	Heat pump	Building Services Engineer	Design Development
7	<b>Solar Photovoltaic system</b>	Specification and design of solar PV system	Building Services Engineer	Design Development
8	<b>Rainwater Harvesting</b>	Design and specify rainwater harvesting system including toilet flushing & automated irrigation system.	Building Services Engineer	Design Development
9	<b>Water Efficiency</b>	Specify fixture in accordance with nominated WELS star ratings.	Architect	Design Development

ESD Initiative Implementation Schedule				
#	Initiative	Requirement	Responsibility	Stage
10	<b>Operational Waste Management</b>	Provide layout for storage areas.  Specify bins and associated waste management equipment.	Waste Management Consultant	Design Development
11	<b>Construction Waste Minimisation</b>	Prepare construction waste minimisation plan.	Builder/ Waste contractor	Design Development
12	<b>Environmentally Preferable Materials</b>	Specify materials in accordance with nominated schedule.	Architect	Design Development
13	<b>Metering</b>	Specify meters in accordance with nominated schedule.	Building Services Engineer	Design Development
14	<b>Commissioning &amp; Maintenance</b>	Commission & tune all equipment in accordance with performance standards & targets.	Builder/owner corporation	Construction/ occupancy

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## 6. CONCLUSION

This report presents the environmentally sustainable design (ESD) principles, strategies and mechanism of the proposed school redevelopment at 17 Regal Avenue, Thomastown. Integrated passive and active sustainable design will aid in the delivery of an energy efficient, water efficient and healthy building.

In terms of performance outcomes, the analysis presented in this report demonstrates that the proposed redevelopment meets the standard of commercial building envelope energy efficiency required to satisfy the Building Code of Australia. Furthermore, the combination of design features and services initiatives exceeds Best Practice Standard of the BESS assessment.

Accordingly, the sustainable design outcomes detailed in this report are consistent with current industry practice for a development of this scale.



**Dr. Jonathan Duverge**  
Director

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# Appendix 1: BESS

BESS, 17 Regal Ave, Thomastown VIC 3074, Australia 17 Regal Ave, Thomastow...

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## BESS Report

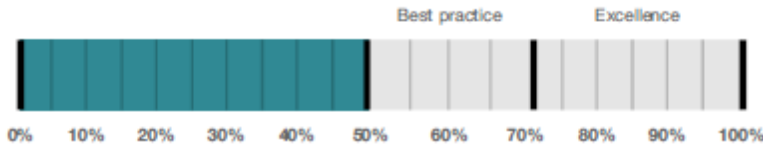
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 17 Regal Ave Thomastown Victoria 3074. 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 Whittlesea 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



# 52%

### Project details

Address	17 Regal Ave Thomastown Victoria 3074
Project no	B2F4C2DE-R1
BESS Version	BESS-8
Site type	Non-residential development
Account	info@nedesign.net.au
Application no.	
Site area	600.00 m <sup>2</sup>
Building floor area	560.00 m <sup>2</sup>
Date	18 June 2024
Software version	1.8.1-B.407

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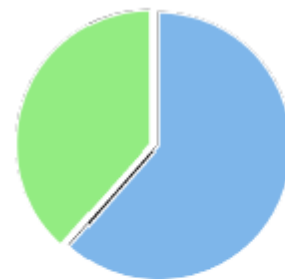


### Performance by category

● Your development ● Maximum available

Category	Weight	Score	Pass
Management	5%	16%	✗
Water	9%	75%	✓
Energy	28%	72%	✓
Stormwater	14%	100%	✓
IEQ	17%	53%	✓
Transport	9%	0%	✗
Waste	6%	33%	✗
Urban Ecology	6%	20%	✗
Innovation	9%	0%	✗

### Building Type composition



● Office ● Other building

**Appendix 2: STORM Results**



# STORM Rating Report

TransactionID: 0  
 Municipality: WHITTLESEA  
 Rainfall Station: WHITTLESEA  
 Address: 17 Regal Avenue  
 ( New Administration Building)  
 Thomastown  
 VIC 3074  
 Assessor: Jonathan Duverge  
 Development Type: Other  
 Allotment Site (m2): 600.00  
 STORM Rating %: 105

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof area to tank	355.00	Rainwater Tank	5,000.00	20	141.30	70.00
Untreated roof area	97.00	None	0.00	0	0.00	0.00
Untreated courtyard	28.00	None	0.00	0	0.00	0.00

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Date Generated: 10-Jun-2024

Program Version: 1.0.0

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# Appendix 3: Façade Calculator Calculator

## Administration Building

### Façade

Report

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**Project Summary**

Date: 10/06/2024  
 Name: Jonathan Duverge  
 Company: Northern Environmental Design  
 Position: Director  
 Building Name / Address: 17 Regal Avenue Thomastown New Administration Building  
 Building State: VIC  
 Climate Zone: Mild temperate  
 Building Classification: Class 5 - office building  
 Stores Above Ground: 1  
 Tool Version: 1.5 (May 2024)

The summary below provides an overview of where compliance has been achieved for Specification S37 - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

	North	East	South	West	Method 2 All
Wall-glazing U-Value (W/m <sup>2</sup> .K)	2.66	1.08	1.33	1.17	1.73
Solar Admittance	0.13	0.04	0.06	0.02	
AC Energy Value					29

**Method 1**

---

**Project Details**

	North	East	South	West
Glazing Area (m <sup>2</sup> )	45.06	5.52	14.928	6.698
Glazing to Façade Ratio	42%	11%	16%	13%
Glazing References	W3 W2 W4 W5 W1	W3 W4	W3 W4 W5	W2 W5
Glazing System Types	Fixed Sliding Door Casement Awning	Fixed Casement	Fixed Casement	Sliding Door Fixed
Glass Types	Single Glazing - low-E coating	Single Glazing - low-E coating	Single Glazing - low-E coating	Single Glazing - low-E coating
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m <sup>2</sup> .K)	5.60	5.60	5.60	5.60
Average Glazing SHGC	0.43	0.43	0.43	0.43
Shading Systems	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
Wall Area (m <sup>2</sup> )	62	44.7	79	45.8
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Lightweight Wall + R2.5	Lightweight Wall + R2.5	Lightweight Wall + R2.5	Lightweight Wall + R2.5
Wall Thickness	105	105	105	105
Average Wall R-value (m <sup>2</sup> .K/W)	1.92	1.92	1.92	1.92
Solar Absorptance	0.55	0.55	0.55	0.55

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OFFICIAL

# ADVERTISED PLAN

# School Alteration

## Façade

Report

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Project Summary

**Date**  
10/06/2024

**Name**  
Jonathan Duverge

**Company**  
Northern Environmental Design

**Position**  
Director

**Building Name / Address**  
17 Regal Avenue Thomastown  
School Alteration

**Building State**  
VIC

**Climate Zone**  
Climate Zone 6 - Mild temperate

**Building Classification**  
Class 9b - schools

**Storeys Above Ground**  
1

**Tool Version**  
1.5 (May 2024)

The summary below provides an overview of where compliance has been achieved for Specification S37 - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Aspects).

	North	East	Method 1 South	West	Method 2 All
Wall-glazing U-Value (W/m².K)	2.91	2.75	0.67	0.45	1.76
Solar Admittance	0.17	0.07	0.02		
AC Energy Value					25

**Method 1**

Wall-glazing U-Value

Solar Admittance

**Method 2**

Wall-glazing U-Value - ALL

AC Energy Value

Project Details

	North	East	South	West
Glazing Area (m²)	30.464	25.88	2.3464	0
Glazing to Façade Ratio	54%	59%	5%	0%
Glazing References	W1	W1 W2	W1	
Glazing System Types	Double Hung	Double Hung Sliding Door	Double Hung	
Glass Types	Single Glazing - low-E coating	Single Glazing - low-E coating	Single Glazing - low-E coating	
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	5.00	5.00	5.00	
Average Glazing SHGC	0.40	0.40	0.40	0.00
Shading Systems	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
Wall Area (m²)	26	25.5	44	51
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Lightweight Wall + R2.5 Brick venner (90 Stud + R2.5)	Lightweight Wall + R2.5 Brick venner (90 Stud + R2.5)	Brick venner (90 Stud + R2.5) Internal (Timber stud) + R 2.5	Brick venner (90 Stud + R2.5) Internal (Timber stud) + R 2.5
Wall Thickness	105 240	105 240	240 90	240
Average Wall R-value (m².K/W)	2.16	2.11	2.22	2.34
Solar Absorptance	0.55 0.6	0.55 0.6	0.55 0.6	0.55 0.6

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## Appendix 4: VOC and Formaldehyde Limits

<b>Product Category</b>	<b>Max TVOC content grams per litre (g/L) of ready to use product</b>
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustics sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealant	100

Table: Maximum TVOC limits for Paints, Adhesives and Sealants

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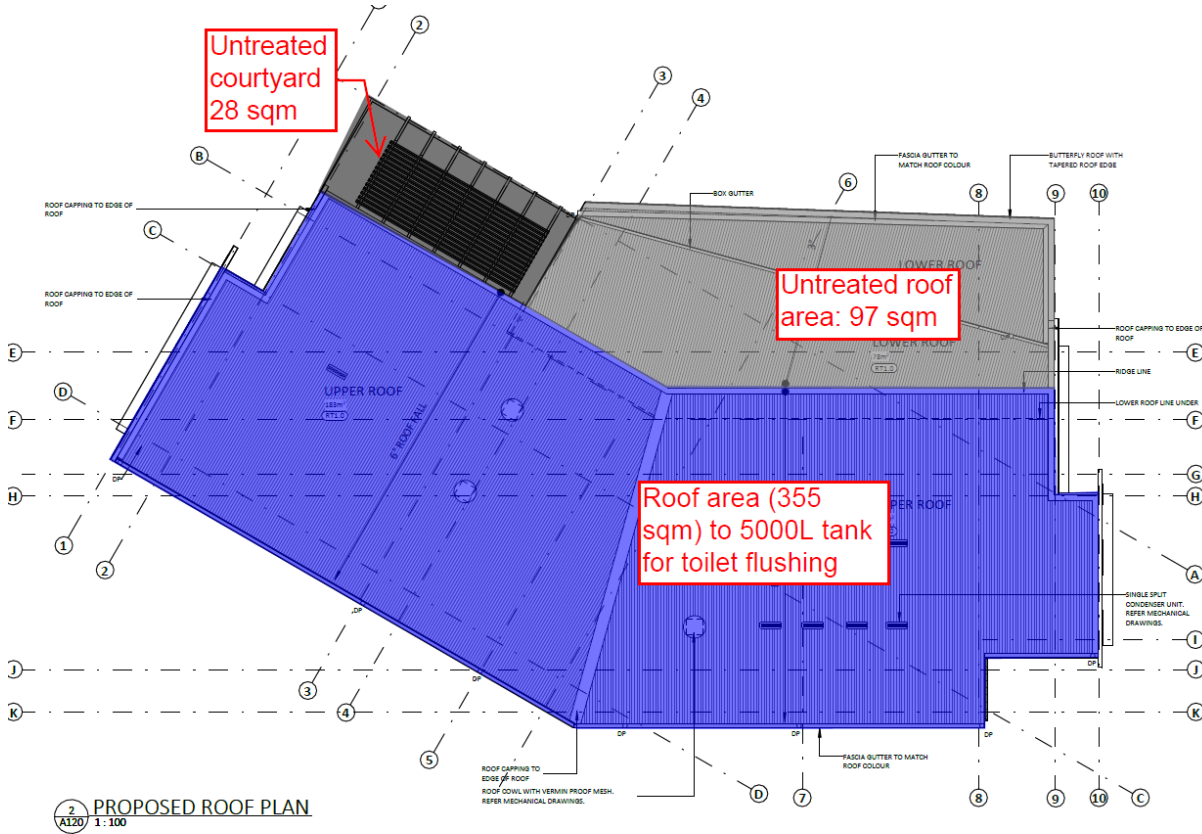
<b>Test Protocol</b>	<b>Emission limit/Unit of Measurement</b>
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for plywood	$\leq 1$ mg/L
AS/NZS 1859.1:2004- Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	$\leq 1.5$ mg/L
AS/NZS 4357.4 – Laminated Veneer Lumber (LVL)	$\leq 1$ mg/L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) -LVL	$\leq 1$ mg/L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	$\leq 1$ mg/L
JIS A 5905:2003- MDF, with use of testing procedure JIS A 1460	$\leq 1$ mg/L
JIS A 1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	$\leq 0.1$ mg/m <sup>2</sup> hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	$\leq 0.1$ mg/m <sup>2</sup> hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), (applicable to high pressure laminates and compact laminates)	$\leq 0.1$ mg/m <sup>2</sup> hr (at 3 days)
ASTM D6007	$\leq 0.12$ mg/m <sup>3**</sup>
ASTM E1333	$\leq 0.12$ mg/m <sup>3***</sup>
EN 717-1 (also known as DIN EN 717-1)	$\leq 0.12$ mg/m <sup>3</sup>
EN 717-2 (also known as DIN EN 717-2)	$\leq 3.5$ mg/m <sup>2</sup> hr

Table: Formaldehyde Emission Limit values for Different Testing Protocols

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# Appendix 5: Roof Catchment Plan



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