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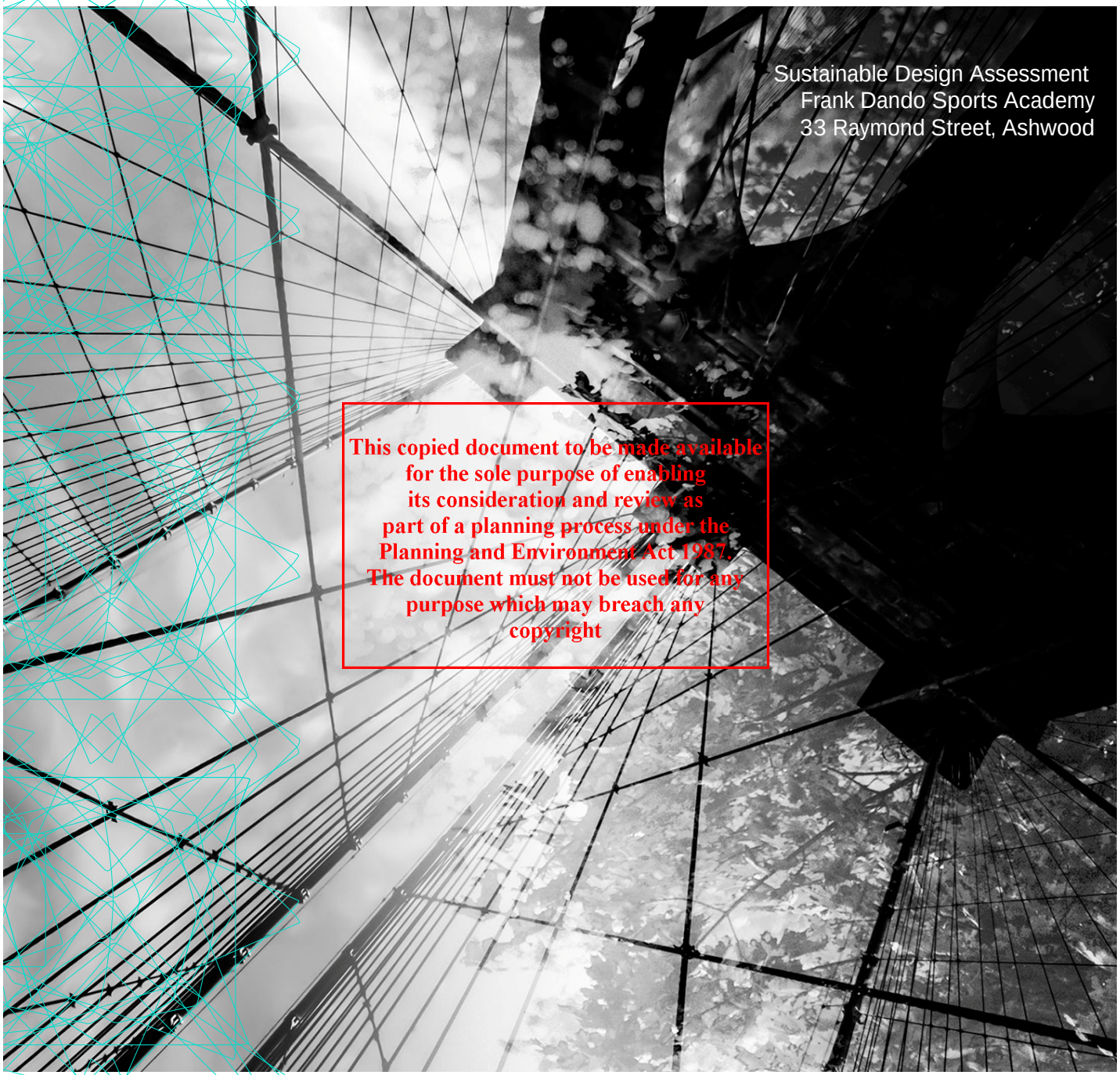

Sustainable Design Assessment
Frank Dando Sports Academy
33 Raymond Street, Ashwood

SUSTAINABLE DEVELOPMENT
_CONSULTANTS

Proposed Educational Development
Frank Dando Sports Academy
33 Raymond Street, Ashwood

Sustainable Design Assessment

November 2023

S4956 SDA.V1

PREPARED BY:

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Version	Date of Issue	Description	Author	Approved
V1	02-11-2023	For Council Endorsement	MG	AR

1. Introduction

This Sustainable Design Assessment (SDA) has been prepared to assist the design, construction and operation of the proposed school development at 33 Raymond Street, Ashwood. The development will comprise a double-storey school building.

Sustainable Development Consultants have assessed the proposed development and provided input to the design team. This SDA captures initiatives necessary to ensure that the development meets the sustainability requirements of the City of Monash, as outlined in Section 1.3 of this report.

This document has been prepared by Sustainable Development Consultants with reference to the architectural drawings prepared by Smith and Tracey Architects.

1.1 Site Description

The site at 33 Raymond Street, Ashwood, is located approximately 16km south-east of the Melbourne CBD, near the corner of High Street and Huntingdale Road. The development site is currently occupied by a double-storey dwelling which will be demolished to allow for the construction.

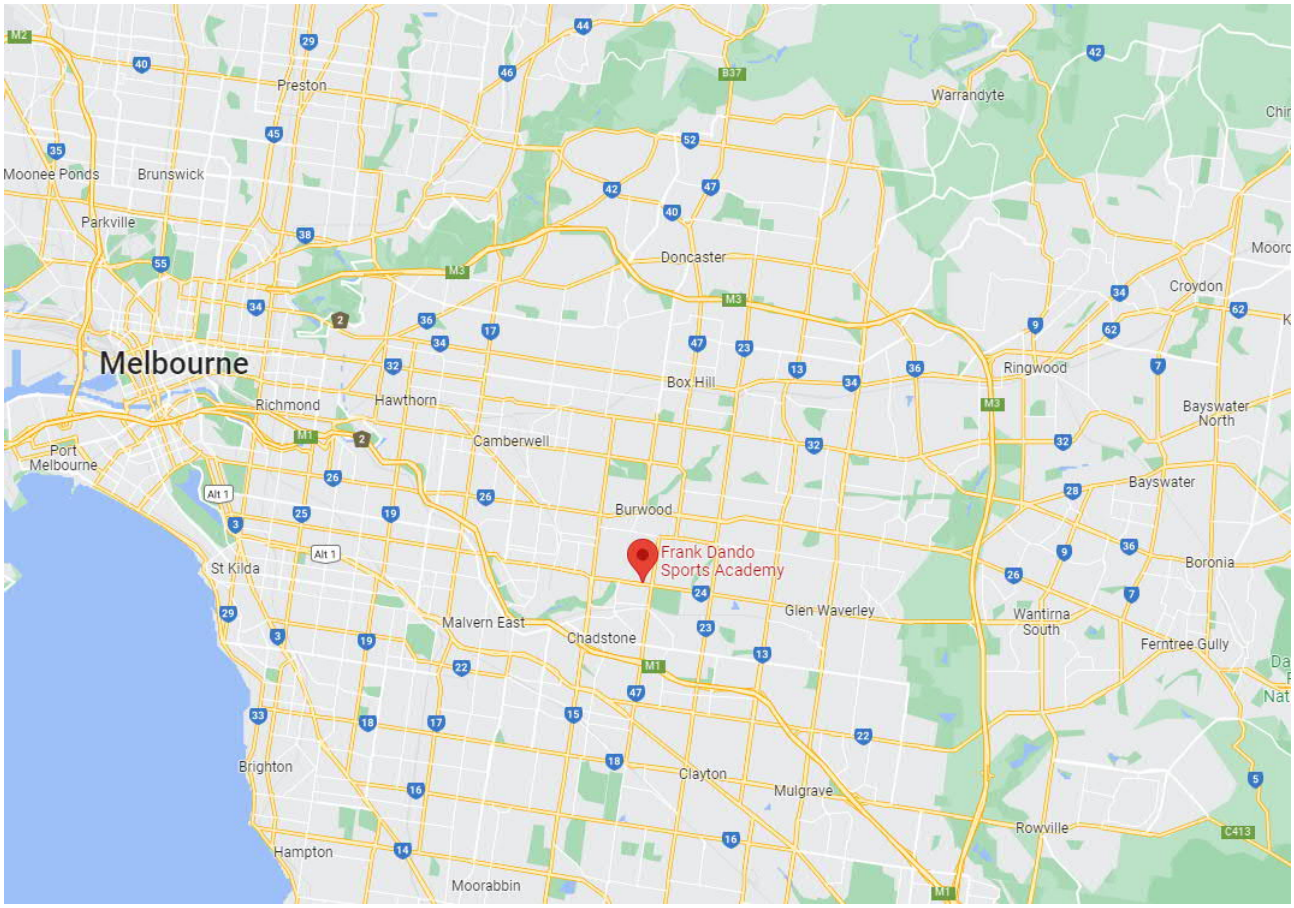


Figure 1: Location of 33 Raymond Street, Ashwood in relation to the Melbourne CBD (Source: Google Maps)

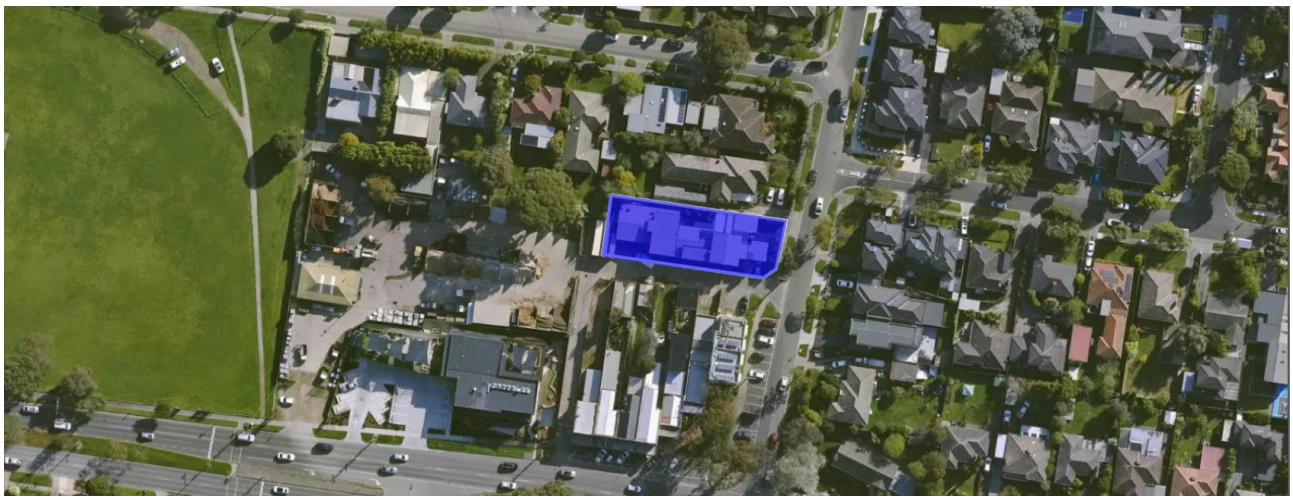


Figure 2: Aerial image of the development site at 33 Raymond Street, Ashwood (Source: LandChecker, mark-up by SDC)

1.2 Development Summary

Set out in Table 1 below is a development summary for this project.

Table 1: Development Summary

Development Information	
Total Site Area	Approximately 867m^2
Carparking and Bicycles	7 on-site car spaces & 10 bicycle spaces
Ground/ Level 1	Teaching/ learning spaces and cafe.

1.3 Monash City Council Requirements

Monash City Council is committed to encouraging land use and development that is energy and resource efficient, supports a cooler environment and minimises greenhouse gas emissions. Critical to achieving this commitment is for development to meet appropriate environmental design standards.

Monash City Council expects that the school should achieve best practice in environmentally sustainable development from the design stage through to construction and operation.

To comply with the Local Planning Scheme including Clause 22.13 Environmentally *Sustainable Development* this project is required to satisfy the objectives as set out within the following categories, where applicable:

- Energy Performance
- Integrated Water Management
- Indoor Environment Quality
- Transport
- Waste Management
- Urban Ecology

This requires a Sustainable Design Assessment (SDA) which demonstrates how for this project, the relevant policy objectives will be achieved.

Monash City Council also requires that this project addresses the following planning scheme provisions:

- Clause 52.34 *Bicycle Facilities*
- Clause 53.18 *Stormwater Management in Urban Development*

1.4 ESD Assessment Tools

There are several calculators and modelling programs available in Victoria to assess proposed developments against benchmarks for ESD, as set by the Victorian government, local Councils and the Building Code of Australia.

For this project, set out below are the assessment tools that have been adopted for this project.

1.4.1 BESS

BESS was developed by the Council Alliance for Sustainability in the Built Environment (CASBE). This tool assesses the energy and water efficiency, thermal comfort and overall environmental sustainability performance of new buildings or alterations. It was created to demonstrate that new development meets sustainability requirements as part of a planning permit application.

A BESS assessment has been conducted for the proposed development. This provides a guide as to the level of sustainability achieved by the proposed development in line with the Council's ESD requirements.

Each target area within the BESS tool generally receives a score of between 1% and 100%. A minimum score of 50% is required for the energy, water and indoor environment quality (IEQ) areas, whilst a 100% score is required for stormwater. An overall score of 50% for the project represents 'Best Practice' while a score over 70% represents 'Excellence'.

The results of the BESS assessment can be found in Appendix 1 of this report.

1.4.2 MELBOURNE WATER STORM CALCULATOR

Melbourne Water has developed the STORM calculator to simplify the analysis of stormwater treatment methods. The calculator is designed to enable a simple assessment of Water Sensitive Urban Design (WSUD) measures. The STORM Calculator determines the amount of treatment that typical WSUD measures will provide in relation to best practice targets.

The results of the STORM assessment can be found in Appendix 2 of this report.

2. Sustainability Initiatives

The following sections outline the initiatives that will be incorporated into the development throughout its design, construction and operation. Initiatives that are included to contribute towards the BESS benchmark have a reference next to them, e.g. (BESS Management 4.1). Some initiatives without the BESS reference have also been included as they also contribute to the overall sustainability of the development.

The following sections, as well as nominating the sustainability initiatives, also identify the party/parties responsible for implementation of the initiative, and the stage at which implementation will be demonstrated.

The following are the broad project stages:

1	Design Development	• Consultants develop conceptual design drawing to a detailed stage suitable as a basis for preparing working drawings - Integration of architectural, services, structure and site attributes • Checking compliance with all statutory requirements, codes and standards • Arranging special surveys or reports as required
2	Construction Documentation	• Architectural and services drawing sets completed • All specialist reports completed • All necessary planning and building consents obtained as required by authorities
3	Construction	• All work carried out onsite – site preparation, construction, alteration, extension, demolition • Purchase of all materials / certification • Evidence gathering from subcontractors • Commissioning
4	Post Occupancy	• Operation and Maintenance • Education – Building Users Guides

2.1 Energy Efficiency

The development will minimise energy use through best practice building envelopes and efficient heating and air conditioning, as well as efficient hot water systems and lighting.

Design Requirements	Responsibility & Implementation	Project Stage
Building Envelope (BESS Energy 1.1, 2.1 & 2.2)		
The building envelope will meet the energy efficiency requirements of the NCC BCA via either a Deemed-to-Satisfy assessment or JV3 modelling. A preliminary Building Code of Australia (BCA) Section J DTS assessment has been completed to provide an example solution for building fabric that could be implemented to meet this requirement. Please see Appendix 5 for details of this preliminary assessment.	ESD Consultant / Architect / Services Consultant	Construction Documentation
Heating and Cooling Systems (BESS Energy 2.1, 2.2 & 2.3)		
Heating and cooling for all spaces within the development will be provided by energy efficient air conditioners selected within one star of the most efficient or Co-efficient of Performance (COP)/Energy Efficiency Rating (EER) not less than 85% of the most efficient capacity unit available.	Mechanical Engineer	Design Development

Design Requirements	Responsibility & Implementation	Project Stage
Domestic Hot Water (BESS Energy 2.3, 2.4 & 3.2)		
Hot water to the development to be provided via electric heat pump with a COP of 3.5 or greater. All pipework will be insulated to minimise distribution heat losses.	Services Consultant	Design Development
Indoor Lighting (BESS Energy 3.7)		
Energy consumption from artificial lighting throughout the development to be reduced by using LED lighting and optimising daylight diffusion via light-coloured internal surfaces (particularly walls, furniture and ceilings). Lighting levels must not exceed the maximum wattages listed in Table J7D3a of the 2022 BCA without the use of any adjustment factor.	Electrical Engineer	Design Development
External Lighting		
External lighting will be LED and will have controls (e.g. motion detectors, and timers) to minimise consumption during off-peak times (e.g. 11pm-5am).	Electrical Engineer	Design Development
Energy Efficient Appliances		
All appliances provided as part of the base building works will be selected within one energy efficient star of the best available.	Developer	Construction Documentation
Lift		
The design places the lift adjacent to the stairs, thus making it easier for users to have the choice of using the stairs. An energy efficient lift will be specified that includes: Measures to specifically reduce stand-by consumption such as: • Switching off control devices when the lift is not in motion & using more efficient power supply unit; • LED lights and display; and Suspension specifically designed to reduce friction.	Service Consultant	Design Development
Renewable Energy Systems - Solar (BESS Energy 4.2)		
Peak electricity demand to be reduced with the addition of roof-mounted solar photovoltaic arrays. This will generate green energy and help to offset the HVAC and internal lighting loads of the development. Space on the roof of the school is allocated for the provision of a minimum 10kW solar PV system. This PV system will reduce mains electricity use and the overall greenhouse gas emissions of the building by producing an estimated 11,480kWh of green electricity per year assuming an inclination of 3˚ and orientation to the North.[1]	Architect / Electrical Engineer	Design Development

[1] Solar PV annual energy generation calculated through BESS.

2.2 Water Resources & Stormwater Treatment

Water will be used efficiently throughout the development through efficient fixtures and fittings, and collection and use of rainwater which helps to reduce mains water requirements and diverts stormwater.

Design Requirements	Responsibility & Implementation	Project Stage
Water Fixtures and Fittings (BESS Water 1.1)		
Efficient water fittings and fixtures will be installed to reduce the volume of mains water used. The following Water Efficiency Labelling Scheme (WELS) star ratings will be specified: • Kitchen and Bathroom taps: flowrate ≤6.0L/min (≥5 Star) • Toilets: dual flush, 3/4.5 L/flush (≥4 Star) • Urinals: ≤0.8L/flush (6 Star or waterless) • Showers: ≥6.0L/min but ≤7.5L/min (≥4 Star) • Dishwashers: ≤11.8L/cycle (≥5 Star) • Washing Machine: ≤10L/kg clothes (≥4 Star)	Architect / Services Consultant	Design Development
Rainwater Collection and Reuse (BESS Water 1.1 & Stormwater 1.1)		
A total effective roof catchment area of 610m² will harvest stormwater into a rainwater tank(s) with an effective storage capacity of at least 10,000L for the development. Collected water will be used for toilet flushing and will also be made available for landscape irrigation. Please refer to Appendix 2 for detailed STORM assessment results.	Civil / Hydraulic Engineer	Design Development
Water Efficient Landscaping (BESS Water 3.1)		
Landscaping in garden beds will be drought tolerant and will include mulch and soil wetting agents to reduce the potable water which will be required to water these garden areas in future. Alternatively, this portion of landscaping will be designed in accordance with xeriscape principles, emphasizing drought tolerance and grouping plants with similar water demand characteristics together. If required, a sub-surface drip irrigation system with moisture sensor override will be specified, however it is a requirement that some landscaped areas be designed so as not to require any watering after an initial establishment period.	Developer	Construction Documentation

Figure 3: Examples of drought tolerant landscaping that could be incorporated into the development design

2.3 Indoor Environment Quality

Indoor Environment Quality (IEQ) will be improved through various initiatives which help to create a healthy indoor environment free from toxins with ample supply of daylight and outside air.

Design Requirements	Responsibility & Implementation	Project Stage
Daylight Access (BESS IEQ 1.4)		
A combination of skylights and glazing to the teaching, offices, and shared spaces will allow daylight access and external views to reduce reliance on artificial lighting and improve indoor amenity. This provision has been tempered by the requirement to control the solar gains which come through large windows. Daylight penetration through windows/openings will be enhanced with the use of light internal colours, allowing for a better internal reflection of daylight. Green Star Daylight Hand Calculations have been completed for the proposed design, with the development achieving a minimum daylight factor of 2% across at least 37% of the nominated floor area. Refer to Daylight Assessment in Appendix 3 for the calculations.	Architect	Construction Documentation
Acoustic Comfort		
Acoustic comfort will be achieved ensuring good acoustic separation between spaces External air-conditioning units will be placed away from windows where possible.	Acoustic/ Mechanical Engineer	Construction Documentation
Mechanical Ventilation		
The cafe and bathrooms will have a separate dedicated exhaust fan (range hood) which will not be recycled to any enclosed space within the building; it will be ducted directly outside.	Mechanical Engineer	Design Development
Ventilation (BESS IEQ 2.3)		
The HVAC system will provide outside air at a rate that exceeds the minimum required rate per person outlined in AS 1668.2:2012, by a minimum of 50%, to provide a comfortable and healthy internal environment to the occupants throughout. Additionally, ventilation design to regular use areas will include monitoring capabilities to ensure CO2 levels are maintained below a maximum of 800ppm.	Mechanical Engineer	Construction Documentation
External Shading (BESS IEQ 3.4)		
Effective external shading will be provided to the majority of north and east facing windows serving regularly occupied spaces of the building. This will include eave projection above north-facing windows and a canopy to the east glazed entry door.	Architect	Construction Documentation
Volatile Organic Compounds (VOCs) (BESS IEQ 4.1)		
All paints, adhesives and sealants and flooring (including carpets) will not exceed the limits outlined in Appendix 4. Alternatively, products with no VOCs will be selected.	Builder	Construction Documentation
Formaldehyde Minimisation (BESS IEQ 4.1)		
All engineered wood products will have 'low' formaldehyde emissions, certified as E0 or better. Alternatively, products will be specified with no formaldehyde. Emissions limits are listed in Appendix 4.	Builder	Construction Documentation

2.4 Building, Construction and Waste Management

Initiatives included in building, construction and waste management promote adoption of environmental initiatives at different stages of the project – not just in the project design stage.

Design Requirements	Responsibility & Implementation	Project Stage
Construction Waste Management		
The builder will develop a construction waste management plan (CWMP) for the construction phase. This will include the following: • Waste generation; • Any waste systems; • Minimisation Strategy; • Performance / Reduction targets; • Bin quantity and size; • Collection frequency; • Signage; and • Monitoring and reporting including frequency and method. The CWMP will include a requirement for not less than 70% of all civil works and built form construction waste to be recycled or re-used. The CWMP will require that all hazardous substances, pollutants and contaminants must be managed and disposed of in accordance with all state regulatory requirements. Where these materials are treated, or used on site, they must be in accordance with a sanctioned remediation process. The CWMP may form part of a broader Construction Environmental Management Plan (CEMP).	Builder	Construction Documentation
Operational Waste – Food & Garden Waste (BESS Waste 2.1)		
Dedicated bin spaces will be provided for organic & green waste (FOGO). This will assist to minimise the risk of food and garden waste ending up in landfill.	Architect/ Building Owner	Design Development/ Post Occupancy
Operational Waste – Convenience of Recycling (BESS Waste 2.2)		
Dedicated bin areas will be provided for general waste (landfill), organic & green waste and commingled recyclables. This will assist to minimise the risk of commingled recyclables ending up in landfill. Recycling facilities will be adjacent general waste, but bin colouring and signage will ensure distinction between different waste streams. The recycling facilities of the development will be just as convenient to access as the general waste facilities.	Architect/ Building Owner	Design Development/ Post Occupancy

2.5 Building Materials

Materials initiatives help reduce the use of virgin materials and generating waste and promote the use of materials with lower embodied energy and environmental impacts.

Design Requirements	Responsibility & Implementation	Project Stage
Concrete		
A minimum of 50% of the concrete mix will contain non-potable mains water (rainwater or purchased recycled water).	Builder / Structural Engineer	Construction Documentation
Steel		
Wherever possible, steel for the development will be sourced from a Responsible Steel Maker[2]. Reinforcing steel for the project will be manufactured using energy reducing processes.	Builder / Structural Engineer	Construction Documentation
Timber		
All timber used in the development will be Forest Stewardship Council (FSC) or Program for the Endorsement of Forest Certification (PEFC) certified or recycled / reused.	Architect	Construction Documentation
Cables, pipes, floors and blinds		
All standard uses of cables, pipes, flooring and blinds within the development will either not contain any PVC or will be sourced from a manufacturer/supplier that adheres to the Green Building Council of Australia's *Best Practice Guidelines for PVC in the Built Environment*.	Services Consultant	Construction Documentation
Flooring		
All flooring will be manufactured from materials/products certified under any of the following: • Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2; • Ecospecifier GreenTag GreenRate V3.1; • Good Environmental Choice (GECA); and/or • The Institute for Market Transformation to Sustainability (MTS) Sustainable Materials Rating Technology Standard Version 4.0 – SMaRT 4.0. Alternatively, floor coverings must be durable, include some eco-preferred content, be modular and/or come from a manufacturer with a product stewardship program and ISO 14001certification.	Builder/ Architect	Construction Documentation

Figure 4: Examples of approved environmental labels for products which may be incorporated for the development

[2] A Responsible Steel Maker must have facilities with a currently valid and certified ISO 14001 Environmental Management System (EMS) in place and be a member of the World Steel Association's (WSA) Climate Action Program (CAP).

2.6 Transport

The site at 33 Raymond Street, Ashwood has been assessed using the "Walk Score" locational performance tool. The tool was developed in 2007 by Front Seat using the Google Maps tools. This tool takes into account the number of facilities within close proximity, and public transit based on distance and type of nearby transit lines. Numerical scores of between 0 and 100 for the following 2 aspects are provided:

- Walk Score: 0 being heavily car dependent with access to community facilities that are located some distance away, and 100 reflecting a location that is easily accessible to abundant facilities by foot.
- Transit Score: 0 being the location only provides minimal transit while 100 reflecting a location that is well served by public transport.

The proposed development in Ashwood achieves a Walk score of 72 out of 100 – "Very Walkable" and a Transit Score of 47 out of 100 – "Some Transit", which indicates that most daily errands can be accomplished on foot.

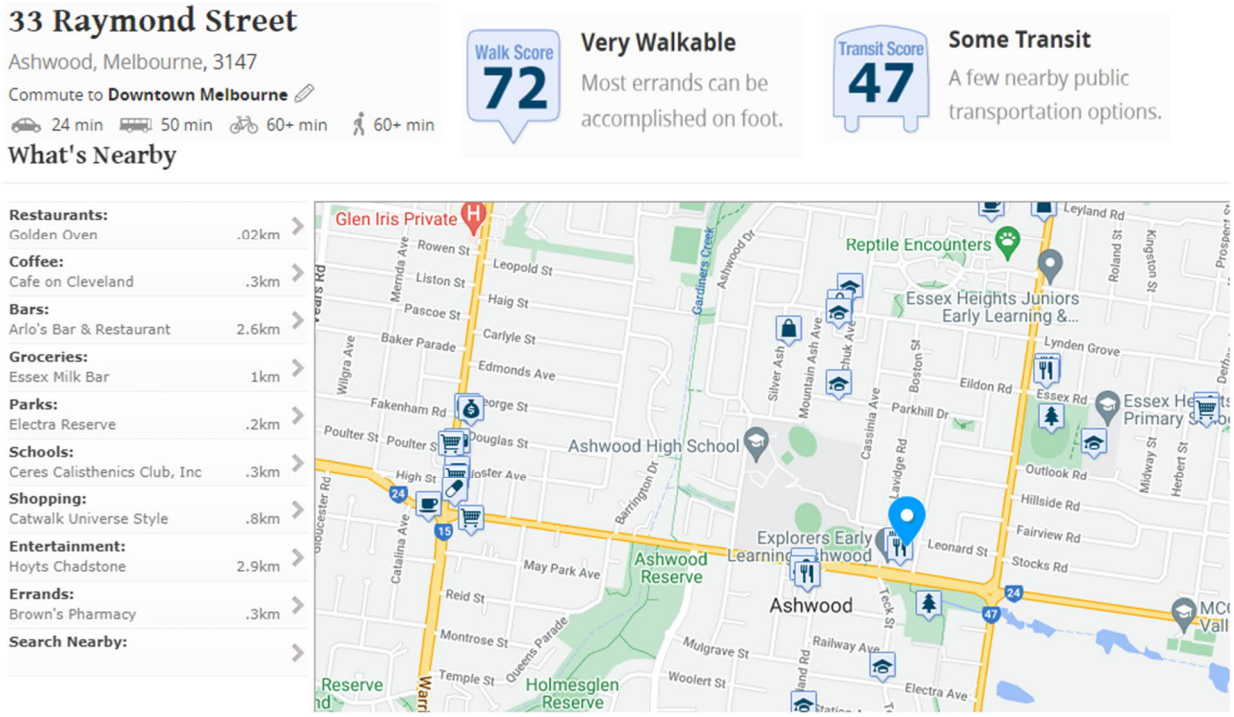


Figure 5: Walk Score results and map showing amenities surrounding 33 Raymond Street, Ashwood. (Source: walkscore.com)

Design Requirements	Responsibility & Implementation	Project Stage
Bicycle Parking		
Ten bicycle spaces are provided for the development.	Architect	Construction Documentation
Public Transport		
The proposed development has direct access within 1km walking distance to the following public transport options: Bus Line: • 734: Eaglehawk – Glen Iris - Glen Waverley • 767: Eaglehawk – Box Hill Station via Chadstone • Jordanville Train Station – Glen Waverly Line	Inherent in Location	

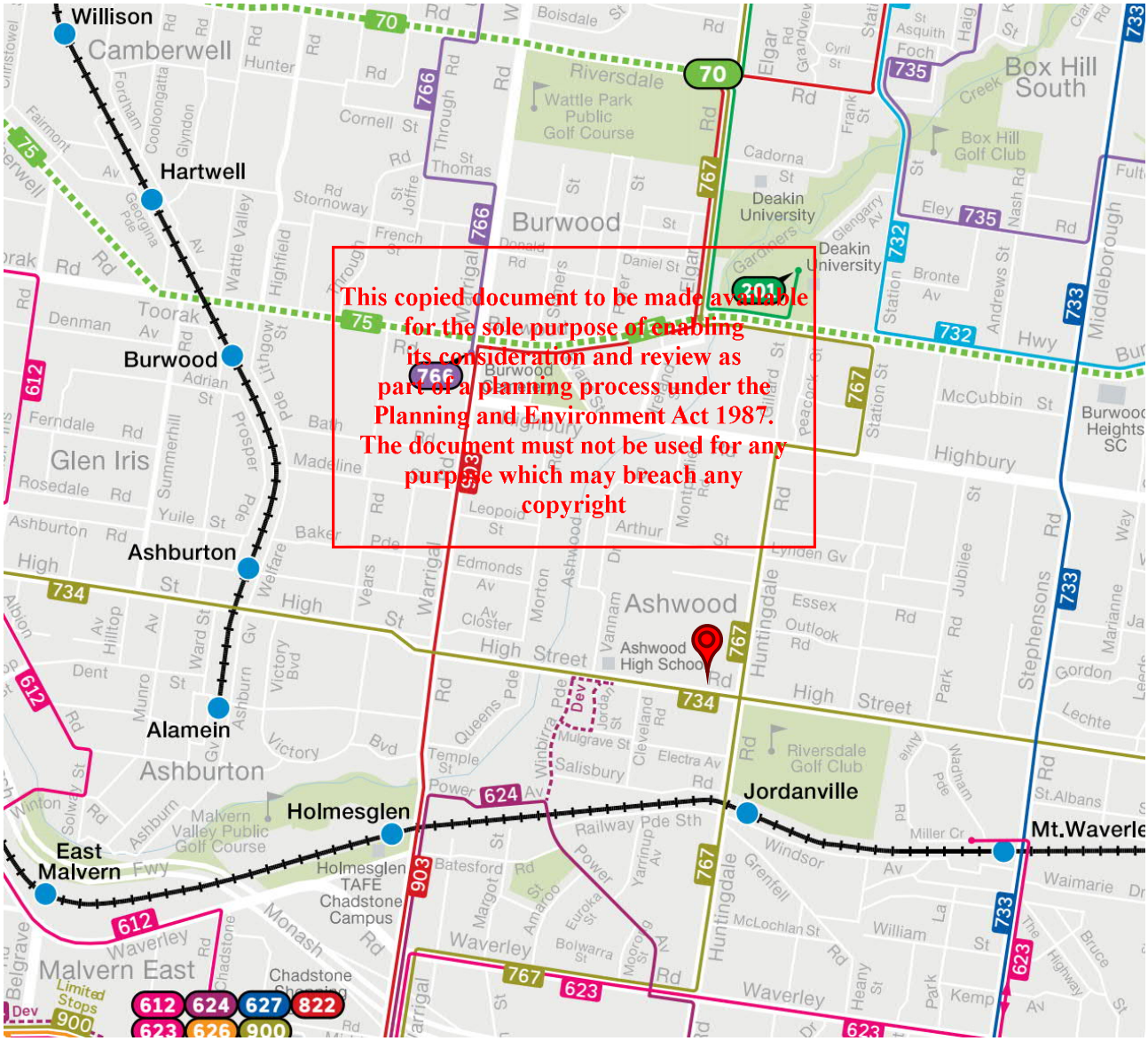


Figure 6: PTV Local Area Map indicating the public transport options surrounding the site (marked by the red balloon. Source: ptv.vic.gov.au)

2.7 Urban Ecology

Design Requirements	Responsibility & Implementation	Project Stage
Communal Spaces (BESS Urban Ecology 1.1)		
A total dedicated area of 86m^2 in the Dining/ Entry has been provided internally to allow for building occupants to gather for social exchange.	Architect	Design Development
Vegetation (BESS Urban Ecology 2.1)		
Approximately 5% of the site is covered with vegetation through the inclusion of planting near the entrance and landscaped areas along the development boundary. It is recommended that several indigenous species be included in the landscaping of the site. This will help maintain/enhance local biodiversity and encourage native birds to visit the space.	Architect / Landscape Architect	Design Development
Refrigerant Ozone Depleting Potential		
All HVAC refrigerants used in the development will be selected to have an Ozone Depletion Potential (ODP) of zero.	Mechanical Engineer	Construction Documentation
Insulation Ozone Depleting Potential		
All thermal insulation used in the development will not contain any ozone-depleting substances and will not use any in its manufacturing.	Architect	Construction Documentation
Light Pollution		
No external luminaire on the project will have an Upward light Output Ratio (ULOR) exceeding 5%, relative to its mounted orientation. External lighting will be designed to avoid light spill off the site or into the night sky.	Architect/ Electrical Engineer	Schematic Design
Urban Heat Island Effect Reduction		
The development will adopt multiple initiatives to reduce the impact of urban heat island effect on the site. These initiatives include areas of landscaping and light-coloured roof finish. Proposed metal roof sheeting will have high solar reflectivity that reduces the solar heat gain into the school when compared to darker roofing options. Colorbond 'Surfmist' would be an appropriate selection. The majority of the site is covered by landscaped areas and roofing. Therefore, the adoption of these initiatives will help contribute to reducing the heat island effect.	Architect	Design Development

3. Conclusion

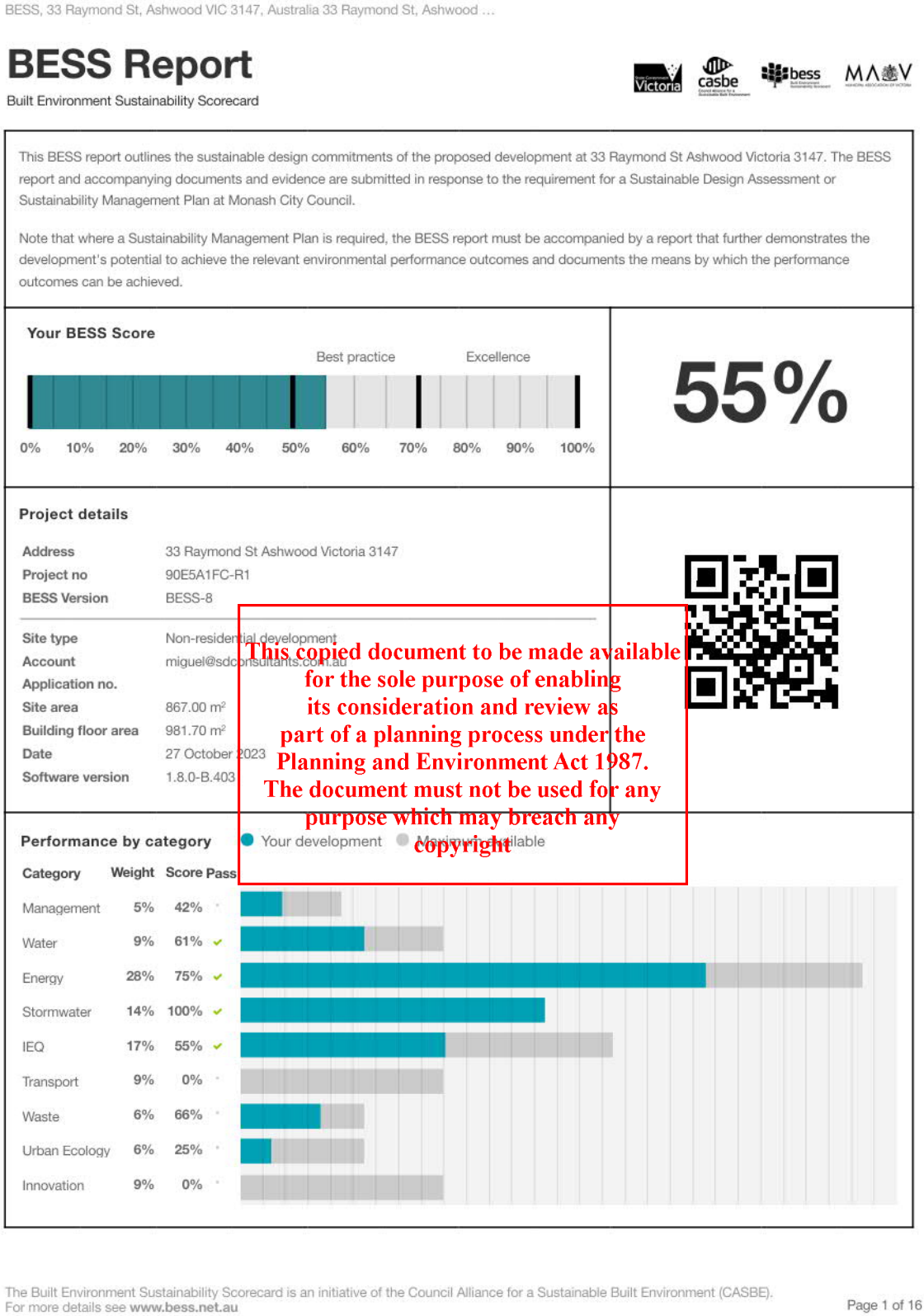
As set out in this SDA the proposed school at 33 Raymond Street, Ashwood, will meet best practice requirements through the initiatives outlined in this report including the use of energy efficient systems, solar PV panels, rainwater collection and reuse and the use of low to zero VOC content materials, as well as reduced environmental impacts during the construction stage.

The initiatives that have been included within this SDA all have a proven track record of serving their individual purpose and can be easily maintained with any failures obvious to the occupants of the development. This helps to ensure the ongoing sustainability of the school, as the systems installed in the beginning are maintained for purpose throughout the life of the building.

The implementation of this SDA requires a clear process that will include:

- Full integration with architectural and building services plans and specifications;
- Endorsement of the SDA with town planning drawings; and
- SDA initiatives to be included in plans and specifications for building approval.

Appendix 1 – BESS Assessment



BESS, 33 Raymond St, Ashwood VIC 3147, Australia 33 Raymond St, Ashwood ...

BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 33 Raymond St Ashwood Victoria 3147. 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 Monash 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

Best practice Excellence

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

55%

Project details

Address	33 Raymond St Ashwood Victoria 3147
Project no	90E5A1FC-R1
BESS Version	BESS-8
Site type	Non-residential development
Account	miguel@sdconsultants.com.au
Application no.	
Site area	867.00 m²
Building floor area	981.70 m²
Date	27 October 2023
Software version	1.8.0-B.403

Performance by category

Your development Maximum available

Category	Weight	Score	Pass
Management	5%	42%	
Water	9%	61%	✓
Energy	28%	75%	✓
Stormwater	14%	100%	✓
IEQ	17%	55%	✓
Transport	9%	0%	
Waste	6%	66%	
Urban Ecology	6%	25%	
Innovation	9%	0%	

The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE).
For more details see **www.bess.net.au**

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Buildings

Name	Height	Footprint	% of total footprint
School	2	610 m²	100%

Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
School	1	982 m²	School	100%
Total	**1**	**981 m²**	**100%**	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.3	Annotation: Sub-meters to be provided to all major common area services (list each)		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Location and size of solar photovoltaic system(s)		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, buffer strips)		-
Waste 2.1	Location of food and garden waste facilities		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Location and size of [illegible]		-
Urban Ecology 2.1	Location and size of vegetated areas		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.1	Details of either the fully natural carpark ventilation or CO monitoring system proposed		-
Energy 3.7	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.4	A short report detailing assumptions used and results achieved.		-

BESS, 33 Raymond St, Ashwood VIC 3147, Australia 33 Raymond St, Ashwood ...

Credit summary

Management Overall contribution 4.5%

		42%
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		50%
3.2 Metering - Non-Residential		N/A ◇ Scoped Out
	The development will not have more than one separate commercial tenancy	
3.3 Metering - Common Areas		100%
4.1 Building Users Guide		100%

Water Overall contribution 9.0%

	Minimum required 50%	61% ✓ Pass
1.1 Potable Water Use Reduction		54%
3.1 Water Efficient Landscaping		100%
4.1 Building Systems Water Use Reduction		N/A ◇ Scoped Out
	The building does not have a sprinkler system and water based heat rejection systems.	

Energy Overall contribution 27.5%

	Minimum required 50%	75% ✓ Pass
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		100%
3.2 Hot Water		100%
3.7 Internal Lighting - Non-Residential		100%
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A ◇ Scoped Out
	No cogeneration or trigeneration system in use.	
4.2 Renewable Energy Systems - Solar		100%
4.4 Renewable Energy Systems - Other		N/A ◇ Scoped Out
	No other (non-solar PV) renewable energy is in use.	

Stormwater Overall contribution 13.5%

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

The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE).
For more details see **www.bess.net.au**

BESS, 33 Raymond St, Ashwood VIC 3147, Australia 33 Raymond St, Ashwood ...

IEQ Overall contribution 16.5%

Minimum required 50%	55%	✔ Pass
1.4 Daylight Access - Non-Residential	37%	✔ Achieved
2.3 Ventilation - Non-Residential	66%	✔ Achieved
3.4 Thermal comfort - Shading - Non-Residential	76%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential	0%	
4.1 Air Quality - Non-Residential	100%	

Transport Overall contribution 9.0%

	0%	
1.4 Bicycle Parking - Non-Residential	0%	
1.5 Bicycle Parking - Non-Residential Visitor	0%	
1.6 End of Trip Facilities - Non-Residential	0%	⊘ Disabled
	Credit 1.4 must be complete first.	
2.1 Electric Vehicle Infrastructure	0%	
2.2 Car Share Scheme	0%	
2.3 Motorbikes / Mopeds	0%	

Waste Overall contribution 5.5%

	66%	
1.1 - Construction Waste - Building Re-Use	0%	
2.1 - Operational Waste - Food & Garden Waste	100%	
2.2 - Operational Waste - Convenience of Recycling	100%	

Urban Ecology Overall contribution 5.5%

	25%	
1.1 Communal Spaces	100%	
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%

	0%	
1.1 Innovation	0%	

The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE).
For more details see **www.bess.net.au**

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Credit breakdown

Management Overall contribution 2%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 42.9% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	
2.3 Thermal Performance Modelling - Non-Residential		50%
Score Contribution	This credit contributes 28.6% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2022 Section J4D6?	
Question	Criteria Achieved ?	
Public building	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2022 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Public building	No	
3.2 Metering - Non-Residential		N/A ◇ Scoped Out
This credit was scoped out	The development will not have more than one separate commercial tenancy	
3.3 Metering - Common Areas		100%
Score Contribution	This credit contributes 20% towards the category score.	
Criteria	Has all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Public building	Yes	
4.1 Building Users Guide		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	Yes	

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Water Overall contribution 6% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Scope out
Kitchen Taps:	>= 5 Star WELS rating
Bathroom Taps:	>= 5 Star WELS rating
Dishwashers:	>= 5 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	>= 6 Star WELS rating
Washing Machine Water Efficiency:	>= 4 Star WELS rating
Which non-potable water source is the dwelling/space connected to?:	Tank 1
Non-potable water source connected to Toilets:	Yes
Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No
Rainwater Tank	
What is the total roof area connected to the rainwater tank?: Tank 1	610 m²
Tank Size: Tank 1	10,000 Litres
Irrigation area connected to tank: Tank 1	0.0 m²
Is connected irrigation area a water efficient garden?: Tank 1	No
Other external water demand connected to tank?: Tank 1	0.0 Litres/Day

1.1 Potable Water Use Reduction		54%
Score Contribution	This credit contributes 83.3% towards the category score.	
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.	
Output	Reference	
Project	4265 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	3156 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	2749 kL	
Output	% Reduction in Potable Water Consumption	
Project	35 %	
Output	% of connected demand met by rainwater	
Project	98 %	
Output	How often does the tank overflow?	
Project	Often	
Output	Opportunity for additional rainwater connection	
Project	1538 kL	
3.1 Water Efficient Landscaping		100%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	
4.1 Building Systems Water Use Reduction		N/A ❖ Scoped Out
This credit was scoped out	The building does not have a sprinkler system and water based heat rejection systems.	

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Energy Overall contribution 21% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate meeting the required NCC2022 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2022 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity Reference fabric & services:	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	-
Heating, Cooling & Comfort Ventilation - Electricity Proposed fabric & services:	-
Heating - Wood - reference fabric and services:	-
Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and services:	-
Hot Water - Electricity - Reference:	-
Hot Water - Electricity - Proposed:	-
Lighting - Reference:	-
Lighting - Proposed:	-
Peak Thermal Cooling Load - Reference:	-
Peak Thermal Cooling Load - Proposed:	-
Solar Photovoltaic system	
System Size (lesser of inverter and panel capacity): PV 1	10.0 kW peak
Orientation (which way is the system facing)?: PV 1	North
Inclination (angle from horizontal): PV 1	3.0 Angle (degrees)

1.1 Thermal Performance Rating - Non-Residential		37%
Score Contribution	This credit contributes 40.0% towards the category score.	
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC2022 Section J)?	

2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 10.0% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	

2.2 Peak Demand		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?		
2.6 Electrification		0%	
Score Contribution	This credit contributes 0% towards the category score.		
Criteria	Is the development all-electric?		
Question	Criteria Achieved?		
Project	Yes		
2.7 Energy consumption		100%	
Score Contribution	This credit contributes 20.0% towards the category score.		
Criteria	What is the % reduction in annual energy consumption against the benchmark?		
3.1 Carpark Ventilation		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?		
Question	Criteria Achieved ?		
Project	Yes		
3.2 Hot Water		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?		
3.7 Internal Lighting - Non-Residential		100%	
Score Contribution	This credit contributes 10.0% 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 ?		
Public building	Yes		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.		
4.2 Renewable Energy Systems - Solar		100%	
Score Contribution	This credit contributes 5.0% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
Output	Solar Power - Energy Generation per year		
Public building	11,480 kWh		
Output	% of Building's Energy		
Public building	31 %		

4.4 Renewable Energy Systems - Other		N/A	Scoped Out
This credit was scoped out	No other (non-solar PV) renewable energy is in use.		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	Melbourne Water STORM tool	
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	112	
Output	Min STORM Score	
Project	100	

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IEQ Overall contribution 9% Minimum required 50%

1.4 Daylight Access - Non-Residential		37%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the nominated floor area has at least 2% daylight factor?		
Question	Percentage Achieved?		
Public building	37 %		
2.3 Ventilation - Non-Residential		66%	✔ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the regular use areas are effectively naturally ventilated?		
Question	Percentage Achieved?		
Public building	0 %		
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?		
Question	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668:2012?		
Public building	50 %		
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?		
Question	Value		
Public building	800 ppm		
3.4 Thermal comfort - Shading - Non-Residential		76%	
Score Contribution	This credit contributes 17.6% towards the category score.		
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?		
Question	Percentage Achieved?		
Public building	64 %		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	What percentage of regular use areas in tenancies have ceiling fans?		
Question	Percentage Achieved?		
Public building	0 %		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?		
Question	Criteria Achieved ?		
Public building	Yes		

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

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Transport Overall contribution 0%

1.4 Bicycle Parking - Non-Residential		0%	
Score Contribution	This credit contributes 22.2% towards the category score.		
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?		
Question	Criteria Achieved ?		
Public building	No		
Question	Bicycle Spaces Provided ?		
Public building	2		
1.5 Bicycle Parking - Non-Residential Visitor		0%	
Score Contribution	This credit contributes 11.1% towards the category score.		
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?		
Question	Criteria Achieved ?		
Public building	No		
Question	Bicycle Spaces Provided ?		
Public building	8		
1.6 End of Trip Facilities - Non-Residential		0%	⊘ Disabled
This credit is disabled	Credit 1.4 must be complete first.		
2.1 Electric Vehicle Infrastructure		0%	
Score Contribution	This credit contributes 22.2% 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 11.1% towards the category score.		
Criteria	Has a formal car sharing scheme been integrated into the development?		
Question	Criteria Achieved ?		
Project	No		
2.3 Motorbikes / Mopeds		0%	
Score Contribution	This credit contributes 22.2% 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 Overall contribution 4%

1.1 - Construction Waste - Building Re-Use		0%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?	
Question	Criteria Achieved ?	
Project	No	
2.1 - Operational Waste - Food & Garden Waste		100%
Score Contribution	This credit contributes 33.3% towards the category score.	
Criteria	Are facilities provided for on-site management of food and garden waste?	
Question	Criteria Achieved ?	
Project	Yes	
2.2 - Operational Waste - Convenience of Recycling		100%
Score Contribution	This credit contributes 33.3% 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 1%

1.1 Communal Spaces		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Question	Common space provided	
Public building	86.0 m²	
Output	Minimum Common Space Required	
Public building	74 m²	
2.1 Vegetation		25%
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	5 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
2.3 Green Walls and Facades		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	No	
3.2 Food Production - Non-Residential		0%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Public building	0.0 m²	
Output	Min Food Production Area	
Public building	25 m²	

Innovation Overall contribution 0%

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

The Built Environment Sustainability Scorecard is an initiative of the Council Alliance for a Sustainable Built Environment (CASBE).
For more details see **www.bess.net.au**

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Appendix 2 – STORM Assessment & WSUD Report

Objectives

The quality and quantity of stormwater leaving a site can have a significant impact on the surrounding infrastructure and waterways. Impervious surfaces move water quickly and efficiently out of built-up areas straight into stormwater infrastructure, which in turn quickly moves the untreated water into natural watercourses. This process does not treat the stormwater and as the water flows into natural water courses, it causes erosion and pollution of those waterways with the rubbish, sediments, pathogens, and other pollutants that run off the impervious surfaces into the stormwater drains.

New developments in the City of Monash must comply with *Clause 53.18* and the best practice performance targets for suspended solids, total phosphorous and total nitrogen, as set out in the Urban Stormwater Best Practice Environmental Management Guidelines, Victoria Stormwater Committee 1999. Currently, these water quality performance targets require:

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

New developments must also incorporate treatment measures that improve the quality of water and reduce flow of water discharged into waterways (such as collection and use of rainwater/stormwater on site) and encourage the use of measures to prevent litter being carried off-site in stormwater flows. The proposed development has addressed these requirements by identifying the impervious surfaces within the site and implementing treatments to mitigate the impacts of stormwater leaving the site. To assess these initiatives, the STORM tool – which is an industry accepted tool – was used to determine the treatment effectiveness of these initiatives.

Site Characteristics

For the purposes of the stormwater assessment, the development has been delineated into basic surface types listed below and highlighted in mark-up plans following:

- Total site area: 867 m²
- Roof catchment area (blue): 610m²
- Permeable surfaces (green): 169m²
- Remaining impervious surfaces (unshaded): 89m²

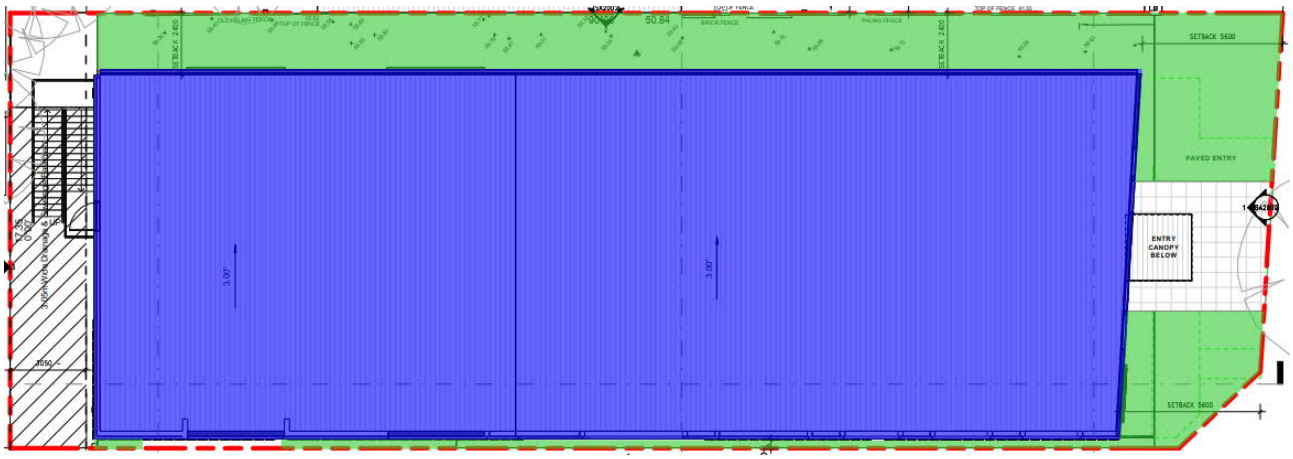


Figure 7: Site delineation

Stormwater Management Initiatives

Stormwater treatment initiatives will need to be implemented. The following section presents the different surfaces that have been identified for treatment, and the required treatment. The initiatives to manage stormwater flows for the building area will underpin the overall performance of the building and its ability to meet stormwater management objectives.

Table 2: List of areas and their stormwater treatment measures

Surfaces	Topographic Area (m^2)	Required Treatment
Roof Catchment Area (Blue)	610m^2	Runoff from the roof catchment area will be diverted to rainwater tank(s) with a total effective storage capacity of at least 10,000L. The stored water will be used for toilet flushing and made available for landscape irrigation. Overflow from the tank(s) will be diverted to the Legal Point of Discharge (LPD) on site.
Landscape (Green)	169m^2	The garden areas are permeable, with no additional treatment required.
Remaining Impervious Area (Unshaded)	89m^2	All remaining impervious area runoff will be diverted directly to the LPD onsite.

Note: There has been no indication of detention requirements on this site. Compliance against the Urban Stormwater Best Practice Environmental Management Guidelines has been achieved via STORM, without detention.

Rainwater Reuse

For the purpose of water consumption calculations within the STORM tool, occupancy has been estimated based on an estimated 16.5L of water usage per occupant per school day. The occupancy density was calculated based on 70 students and 3 staff members.

From this, the total water demand was estimated to be 241kL per year. This is equivalent to approximately 1204L per day, which is reflected as 60 occupants in the STORM tool (based on 20L/person/day).

STORM Results

The recommended treatments have been applied to the STORM tool and as a result, the proposed development has achieved score of 112%. With the proposed stormwater treatment measures incorporated into the development, the design will meet the minimum performance standards required by BESS.

Melbourne Water **STORM Rating Report**

TransactionID:	0	
Municipality:	MONASH	
Rainfall Station:	MONASH	
Address:	33 Raymond Street	
	Ashwood	
	VIC	3147
Assessor:	Miguel Guzman	
Development Type:	Other	
Allotment Site (m2):	867.00	
STORM Rating %:	112	

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof Catchment Area	610.00	Rainwater Tank	10,000.00	60	128.60	68.00
Remaining Impervious Areas	89.00	None	0.00	0	0.00	0.00

Figure 8: Stormwater calculator result

Management and Maintenance Guidelines

Inspections and maintenance of the proposed stormwater treatment systems should occur regularly to ensure their ongoing performance. It is the responsibility of Management to ensure the appropriate measures are undertaken for the rainwater tank maintenance. Some general maintenance requirements are provided in the table below. However, any specific maintenance requirements nominated by the product's manufacturer may also apply and would supersede those outlined below. The proposed system will be nominated at the detailed design stage.

Rainwater Tank

Task	When?	Requirement
Inspect rainwater tanks	Every 6 months	- Check for any damage/compression - Check any blockage of first flush diverter - Correct operation of potable mains back up switch - Check that mesh covers have not deteriorated and intact. - Check that supporting base is free of cracks and movement. - Mosquito infestation
	Every 3-5 years	- Sludge Build up – if sludge build up occurs a vacuum tank needs to be called out to site
Inspect pumps	Every 2 years	- Serviced to prolong the pump life
Inspect roofs & gutters	Every 6 months	- Clean out of leaves / debris - Remove any overhanging branches onsite

Disposal of Waste Materials

The accumulated pollutants found in the stormwater treatment systems must be handled and disposed of in a manner that is in accordance with all applicable waste disposal regulations. When scheduling maintenance, consideration must be made for the disposal of solid and liquid wastes.

Stormwater Runoff Treatment during the Construction Stage

Treatment – Various

Stormwater management in the construction stage will include measures which will be put in place to minimise the likelihood of contaminating stormwater discharge from the site as well as reduce the velocity of the flows generated from the building as it is being constructed. This will mean ensuring buffer strips are in place, and the site will be kept clean from any loose rubbish. More information is available from "*Keeping Our Stormwater Clean – A Builder's Guide*" by Melbourne Water[3]. The diagram below is an illustration of the various objectives which assist in minimising the impacts of stormwater runoff typical during the construction phase. Typical pollutants that are generated from a construction site during a rainfall event include:

- Dust
- Silt
- Mud
- Gravel
- Stockpiled materials
- Spills/oils
- Debris/litter

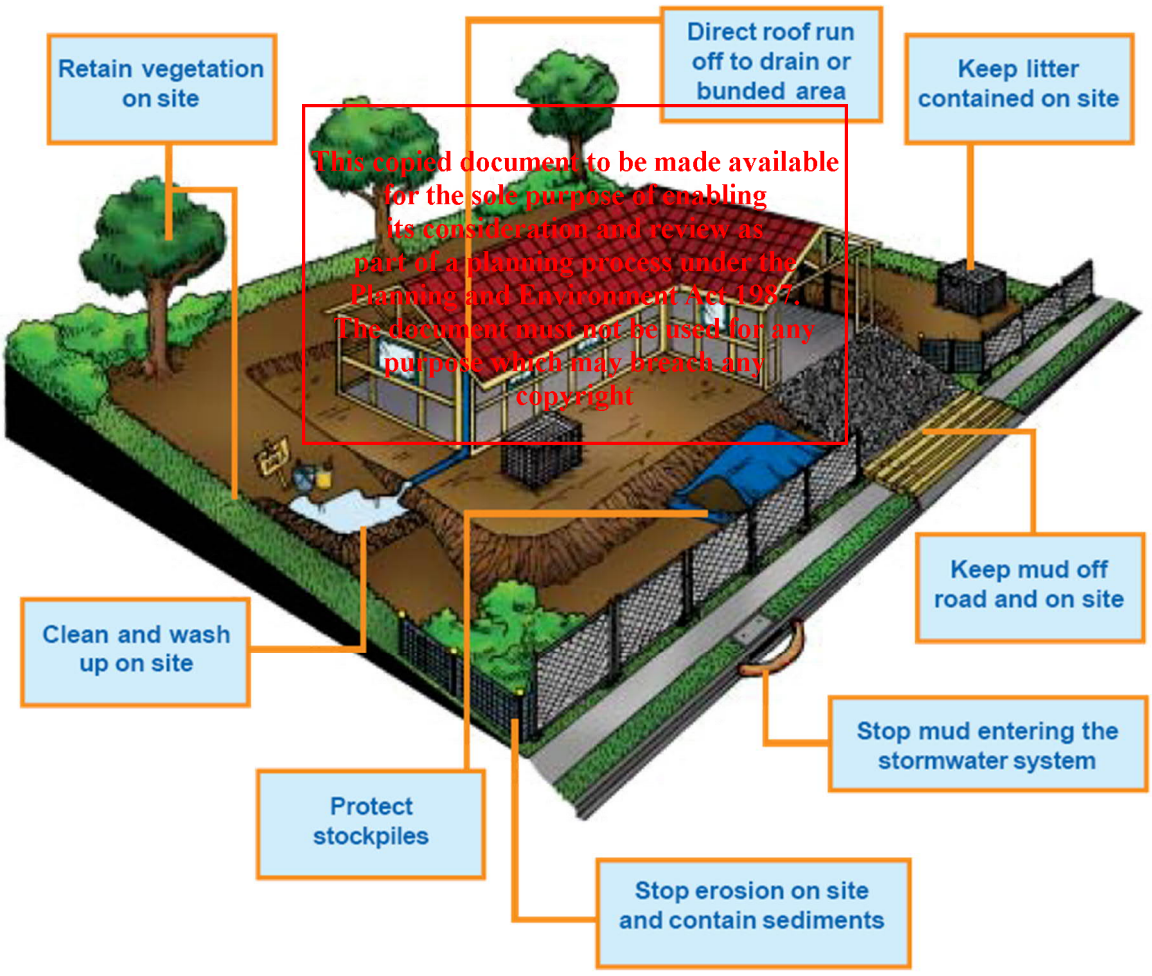
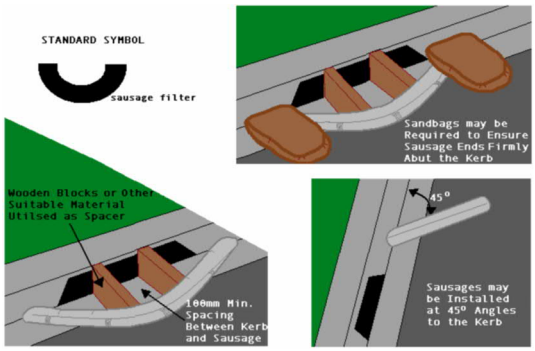


Figure 9: Stormwater will be effectively managed during construction phase according to the requirements listed in "Keeping Our Stormwater Clean – A Builder's Guid

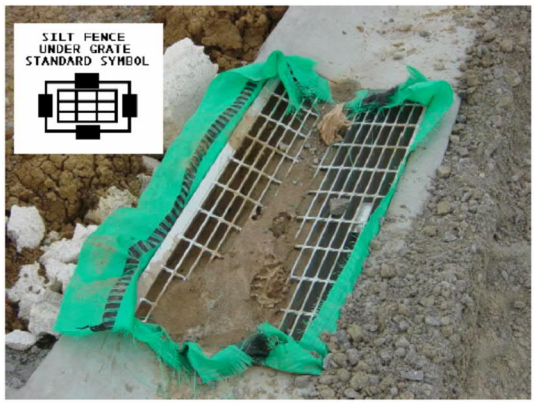
[3] For copies please contact Melbourne Water on 131 722.

To reduce the impacts and minimise the generation of these pollutants the following measures are proposed. The symbols embedded within each image are typically used for Construction Environmental Management Plans.

Gravel Sausage filters – to be placed at the entrance of pits/side stormwater inlets. These permeable sacks will filter the suspended soils and sediments and any other litter carried by the stormwater to prevent the pollutants entering the system.



Silt Fences Under Grates - Silt fence material may be placed under the grate of surface-entry inlets to prevent sediment from entering the stormwater system.



Temporary Rumble Grids – these are designed to open the tread on tires and vibrate mud and dirt off the vehicle (in particular the chassis). This will heavily minimise the amount of soil/dirt deposited on local roads where it can be washed (by rainfall or other means) into the stormwater drains.

Appendix 3 – BESS IEQ Assessments

Daylight Amenity

A daylight assessment has been undertaken using the Green Star Hand Calculations method to determine the percentage of regular use areas with a daylight factor of at least 2%. Areas with red outline represent the nominated area (regularly used spaces) and yellow markups represent the zones of compliance.

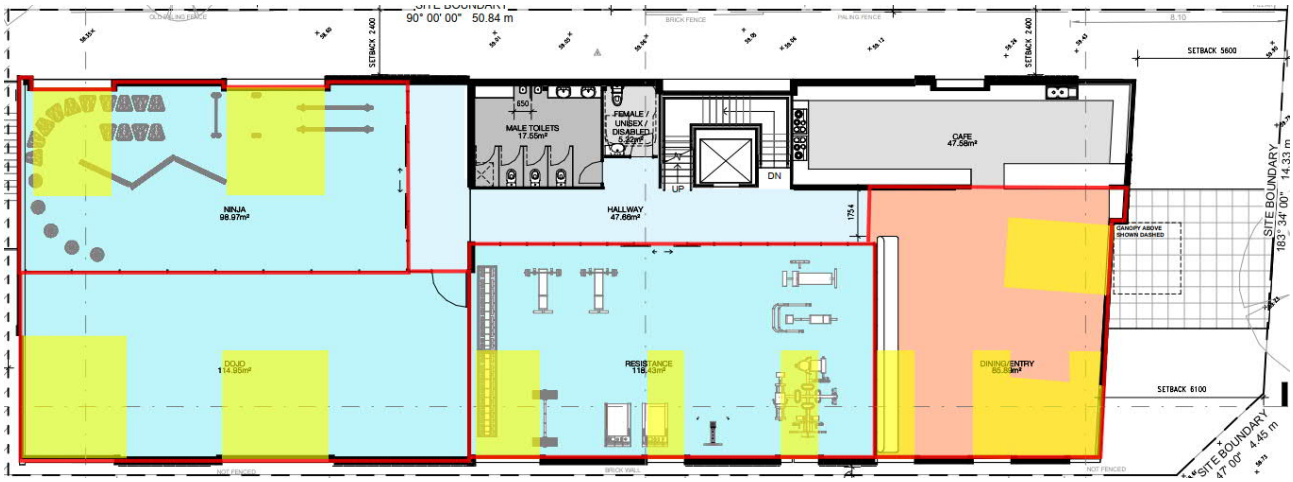


Figure 10: Ground Floor Green Star Daylight Hand Calculations mark up

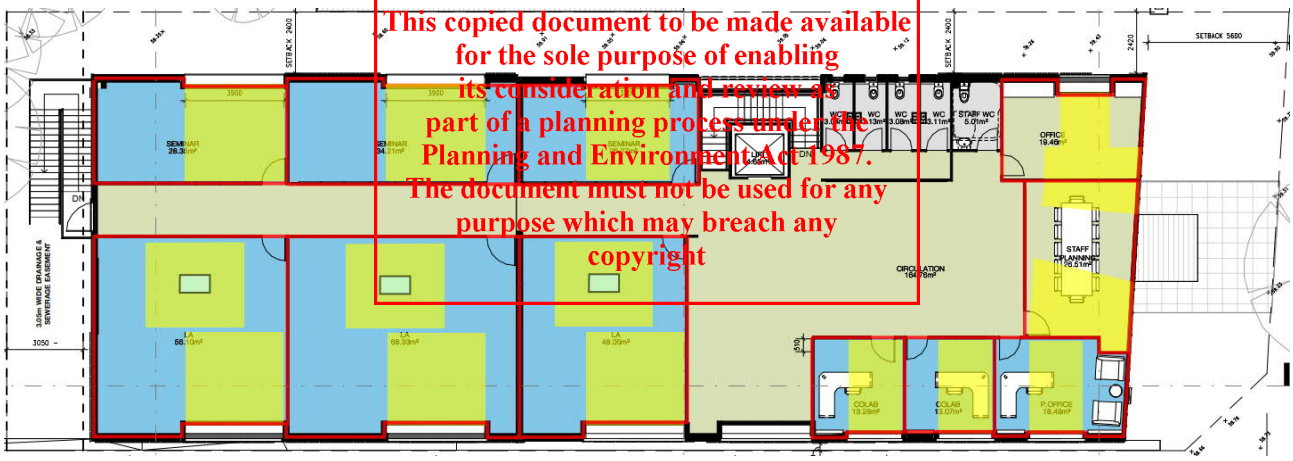


Figure 11: First Floor Green Star Daylight Hand Calculations mark up

Compliance zones for skylights are based on the Zone 1 daylight measurements in 'Daylight Zones: Toplighted spaces' by the Lighting Controls Association[4]. Indicative skylight daylighting has been assumed to be half the height of the skylight to finish floor level dimension.

Based on the Green Star Daylight Hand Calculation Method (and skylight zone of compliance) it is predicted that 37% of the regularly occupied spaces will achieve a daylight factor of at least 2.0%.

$Total\ Nominated\ Area$ = 769.4m^2

$Total\ Zone\ of\ Compliance$ = 284.1m^2

$Percentage\ of\ Compliant\ Area = \frac{Zone\ of\ Compliance}{Nominated\ Area} \times 100$ = 37%

[4] https://lightingcontrolsassociation.org/2011/11/21/daylight-zones-toplighted-spaces/

Appendix 4 – Green Star VOC and Formaldehyde Limits

Table 3: Maximum Volatile Organic Compound Levels for construction materials (Source: Green Building Council Australia – Green Star Buildings Submission Guidelines Version 1, 2021)

Product Type/Sub Category	Max TVOC Content (g/L of ready-to-use-product)
Paints, Adhesives and Sealants	
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
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100
Carpets	
Total VOC limit	0.5 mg/m² per hour
4-PC (4-Phenylcyclohexene)	0.05mg/m² per hour
ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m² per hour
ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5 mg/m² per hour

Table 4: Maximum Formaldehyde levels for processed wood products (Source: Green Building Council Australia – Green Star Buildings Submission Guidelines Version 1, 2021)

Formaldehyde emission limit values for different testing methods	
Test Method	**Emission Limit/ Unit of Measurement**
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	**≤1mg/ L**
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	**≤1.5 mg/L**
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	**≤1mg/ L**
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	**≤1mg/ L**
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	**≤1mg/ L**
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤0.1 mg/m²hr
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	≤0.1 mg/m²hr (at 3 days)
ASTM D6007	≤0.12mg/m³
ASTM E1333	≤0.12mg/m³
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m³
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m²hr

Appendix 5 – Preliminary BCA Section J DTS Assessment

As currently designed, the proposed development can meet the building fabric requirements of the NCC 2022 BCA - Volume One, Section J (Verification Method: Compliance with 'Deemed-to-Satisfy' provisions) as described in this appendix. This assessment is for information only to assist with the town planning application and is not suitable for demonstrating compliance with Part J for building approval.

Building Fabric Element	Description
External and Internal Walls	All external walls which form part of the thermal envelope are required to achieve a minimum total system R-Value of 1.4, accounting for thermal bridging from framing members. The solar absorptance of external envelope walls must not be more than SA 0.60. Refer to Figures 12 to 14 below for a markup of applicable walls.
Floors	Exposed floors forming part of the thermal envelope are required to have added thermal insulation to achieve a total system R-value of at least R2.0. There is no additional insulation requirement for concrete slabs on ground.
Roof Insulation	Roof sections forming part of the thermal envelope are required to have added thermal insulation to achieve a total roof & ceiling system R value of at least R3.2. The solar absorptance of the upper surface of the roof must not be more than SA 0.45. This can be achieved with the use of Colorbond 'Surfmist' (SA 0.32) or similar.
Windows and Glazing	Windows / glazed doors are required to be below the following glass-and-frame combined thermal performance values: U-value: 5.8 W/m²K. SHGC: 0.54 Fenestration systems that can achieve these values include double-glazed units in standard aluminium frames. Glazing performance requirements for construction are to be confirmed based on detailed drawings.
Insulation	Insulation must comply with AS/NZS 4859.1 and be installed so that it forms a continuous barrier and installed with required air space. The insulation must maintain its position and thickness. Insulation must be installed to comply with the requirements of BCA J4D3.

Building Fabric Element	Description
Building Sealing	A seal to restrict air infiltration must be fitted to each edge of a door and operable window in accordance with Provision J5D5, other than glazed elements which comply with AS 2047. All entry doors leading to conditioned spaces must be fitted with a self-closing device. Exhaust fans serving any conditioned spaces must be fitted with self-closing dampers. Roofs, ceilings, walls, floors and any opening such as a window frame, door frame, roof light frame or the like will be constructed to minimise air leakage via the enclosure by internal lining systems or sealed by caulking, skirting, architraves, cornices or the like. Part J4D3 for general thermal construction & installation must be followed.
Artificial Lighting	The proposed lighting design must not exceed the maximum illumination power densities listed in Table J7D3a of the 2022 BCA without the use of any adjustment factors.
Heating, Ventilation & Air Conditioning (HVAC)	Heating and cooling systems selected for the development must be within one star of the most efficient equivalent capacity unit available, or CoP & EER not less than 85% of the most efficient equivalent capacity unit available.
Water Heating Systems	The hot water system selected for the development is to have a COP of 3.5 or greater.

Nominated Thermal Envelope and Insulation Requirement Mark-up

Walls and roof sections forming the thermal envelope are required to comply with the relevant thermal performance values of the 2022 BCA. Applicable envelope walls are highlighted below in red.

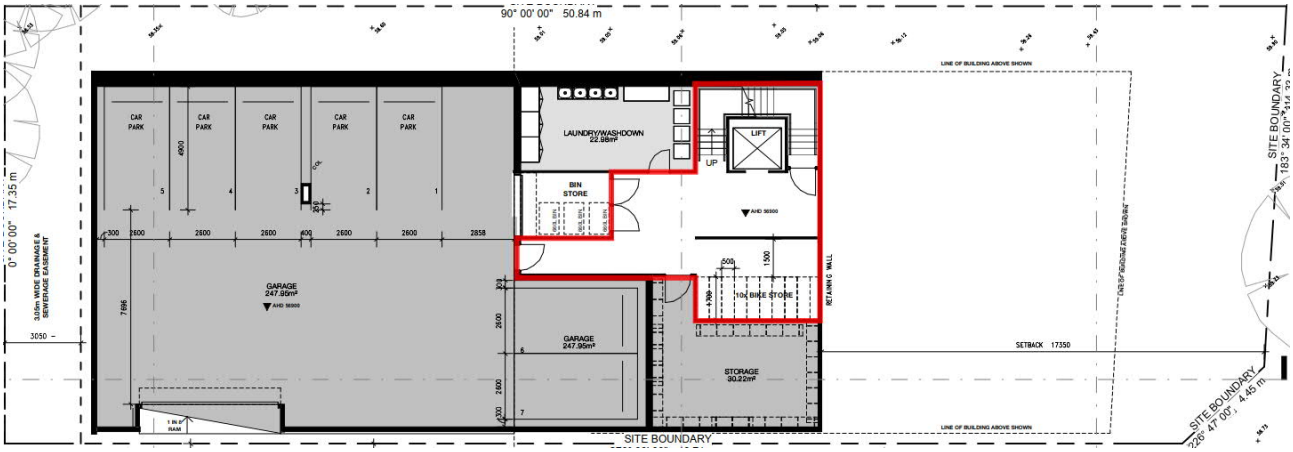


Figure 12: Basement level walls required to achieve a total system R-Value of R1.40

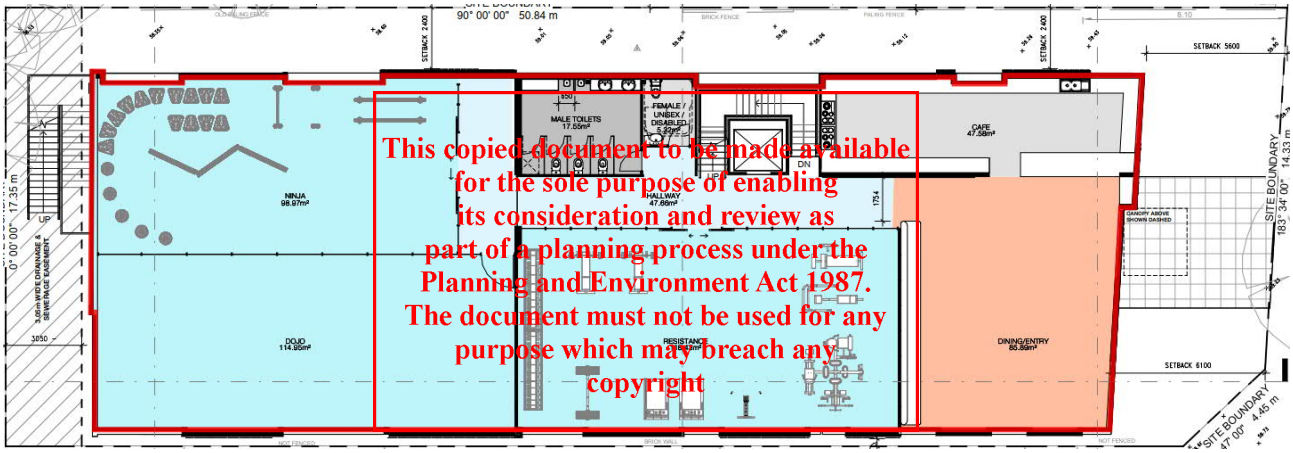


Figure 13: Ground level walls required to achieve a total system R-Value of R1.40

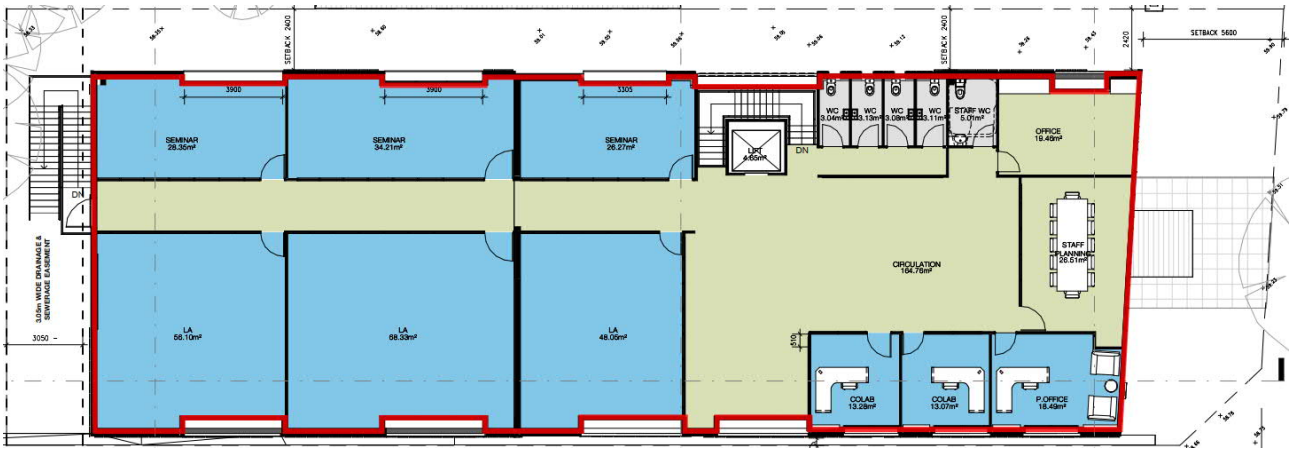


Figure 14: Level 1 walls required to achieve a total system R-Value of R1.40

Preliminary 2022 NCC BCA Façade Calculator

The preliminary BCA Façade Calculator completed for the proposed design is provided below for information purposes only. A full and thorough Part J assessment must be completed once detailed drawings have been developed to ensure all requirements are met for building approval.

ABCB

Façade

Report

National Construction Code Calculator

Project Summary

Date
25/10/2023

Name
Miguel Guzman

Company
SDC

Position
ESD Consultant

Building Name / Address
33 Raymond St
Ashwood VIC 3147

Building State
VIC

Climate Zone
Climate Zone 6 - Mild temperate

Building Classification
Class 9b - schools

Storeys Above Ground
2

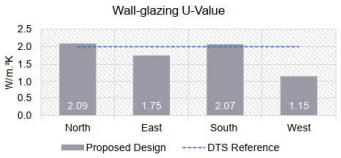
Tool Version
1.2 (June 2020)

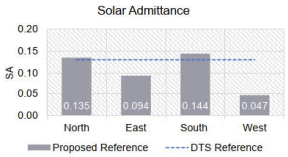
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

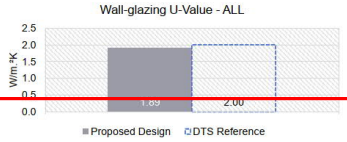
	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	2.09	1.75	2.07	1.15	1.89
Solar Admittance	0.13	0.09	0.14	0.05	
AC Energy Value					154

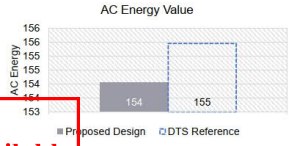
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	80.4	30.79	85.67	10.92
Glazing to Façade Ratio	27%	20%	27%	9%
Glazing References	North, North Shaded	East, East Shaded	South	West
Glazing System Types	Project	Project	Project	Project
Glass Types	Double Glazed Unit - no low-E coating	Double Glazed Unit - no low-E coating	Double Glazed Unit - no low-E coating	Double Glazed Unit - no low-E coating
Frame Types	Aluminium	Aluminium	Aluminium	Aluminium
Average Glazing U-Value (W/m².K)	5.80	5.80	5.80	5.80
Average Glazing SHGC	0.54	0.54	0.54	0.54
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	216.43	120.42	235.8	115.18
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	R1.4 Wall	R1.4 Wall	R1.4 Wall	R1.4 Wall
Wall Thickness	200	200	200	200
Average Wall R-value (m².K/W)	1.40	1.40	1.40	1.40
Solar Absorptance	0.6	0.6	0.6	0.6