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## King David School Sports & Wellness Facility

# Sustainability Management Plan

Prepared for: Fontic Group C/o King David School

Date: 30 March 2022

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# Revision

Revision	Date	Comment	Prepared By	Approved By
DRAFT	26/11/2021	For Review	KKHY	KKHY
01	16/12/2021	For Submission	KKHY	KKHY
02	30/03/2022	For Submission	KKHY	KKHY

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# Disclaimer

Energy modelling provides an estimate of a building's energy performance. This estimate is based on a necessarily simplified and idealised version of the building that does not and cannot fully represent all of the intricacies of the building and its operation. As a result, energy modelling results only represent an interpretation of the potential performance of a building. No guarantee or warranty of building performance in practice can be based on energy modelling results alone.

The results generated from any modelling analysis within this report are based on specific criteria outlined in the National Construction Code (NCC) and Built Environment Sustainability Scorecard (BESS), along with best practice guidelines and are not considered to be a true representation of the actual operation of the building. The intent of these criteria is to permit the project team to estimate the expected annual energy consumption of the proposed building and therefore determine if the building has the ability to be energy efficient.

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# 1. Executive Summary

This report has been prepared at the request of Fontic Group and is intended to provide an overview of the Environmentally Sustainable Design (ESD) initiatives in support of the proposed Sports and Wellness Centre at King David School 519 Orrong Rd, Armadale VIC 3143

This Sustainability Management Plan (SMP) has been prepared to inform DELWP of the proposed amended development's commitment to sustainability, measured against the documented performance guidelines in accordance with Stonnington City Council's Planning Scheme. The Built Environment Sustainability Scorecard (BESS) has been utilised as the sustainability tool to demonstrate compliance with ESD requirements.

The vision of this project is to deliver energy efficient building that incorporate attractive and intelligent design. Key targets and objectives include the following;

The project is targeting:

- **Best Practice Environmentally Sustainable Design** through the use of BESS
- Passive design to achieve good thermal performance, resilience and reducing the need for active energy systems

The following key focuses were adopted by the project team and underpin the design approach:

- **Fossil fuel free** services, utilising no on-site combustion of fossil fuels and the option of sourcing 100% of off-site energy from certified renewable sources.
- Maintain **comfortable internal temperatures** passively, using little or no energy, providing comfortable spaces year round and protecting occupants from extreme weather events.
- Create **healthy spaces** including reduction in the use of harmful VOCs in glues, sealants and paints, and protection from dust and other external airborne pollutants.
- Cost effective design that provides a sustainable outcome, **avoiding over engineering** and providing for **simple maintenance** over time.
- **Minimise consumption** of natural resources, including **water and raw materials**.
- Minimise environmental impacts through **construction**, including **embodied energy** and the **ecological cost of materials**.
- Minimise environmental impacts through **operation**, including **energy consumption, waste creation** and discharge of **pollutants**.
- Provide **sustainable, integrated, convenient travel**.
- The school has an existing PV array installed which will supplement the schools' total energy use. Any further opportunity to increase the PV capacity on the proposed building will be reviewed subject to approval from the local power authority. No additional PV forms part of this planning approval process due to the unknown nature of the electrical authority approval process.

## 1.1 Policy Requirements

The Project and ESD requirements for the amended development have been based on the following documents:

- Stonnington Council Planning Scheme – Clause 22.05 Environmentally Sustainable Development
- ABCB National Construction Code (NCC) 2019

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## 2. Project Information

### 2.1 Project Overview

The amended proposal will provide a new sports and wellness center which will feature indoor and outdoor basketball court, gym, amenities, studios and an administrative office.

Situated at the existing King David Senior school site. The center will be an upgrade to existing facilities.

The proposed development will address the sustainability issues outlined in Stonnington City Council local planning policy.

### 2.2 Development Summary

The proposed amended built form can be summarised as follows:

Floor Level	Description
Lower Ground	Indoor Court, Change Room Amenities and Indoor Gym, Entrance Foyer,
Mezzanine	Viewing Deck, Admin Office and Studio Space
Upper Floor	Outdoor Court, Entrance Foyer, Plant Room

### 2.3 Project Site

The proposed amended development has a total site area of **2000 m<sup>2</sup>**. The project site is shown in the image below.



## 2.4 Design Documentation

For further development summary information, please refer to the relevant design drawings documented as nominated below:

- TP Architectural Drawing Package by JCB – March 2022

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## 3. Summary of Sustainability Commitments

### 3.1 Sustainability Vision

The proposed development of King David School continues to encourage the use of sustainable practises through effective passive design, Water Sensitive Urban Design (WSUD), landscape revegetation.

### 3.2 Stonnington Planning Scheme

Table 1 of Clause 22.05 of the Stonnington Planning Scheme requires developments to propose a Sustainability Management Plan (SMP) as part of an application requirement. The overarching objective is that development should achieve best practice in ESD from the design stage through to construction and operation in the following categories:

- Water Resources
- Indoor Environment Quality
- Stormwater Management
- Transport
- Waste Management
- Urban Ecology

### 3.3 Sustainability Commitments & Targets

Sustainability is a fundamental guiding principle embedded in the project. The key sustainability targets for the project are structured around BESS score for best practise ESD Minimum 50% Score

#### 3.3.1 Built Environment Sustainability Scorecard (BESS)

In addition to the sustainable design elements nominated above, the proposed amended development has completed a Built Environment Sustainability Scorecard (BESS) assessment.

BESS assesses energy and water efficiency, thermal comfort, and overall environmental sustainability performance of a new building or alteration. It was created to assist builders and developers to demonstrate that a project meets sustainability information requirements as part of a planning permit application and is considered an acceptable tool for ESD benchmarking.

In order to achieve a 'Best Practise' score in BESS, the project must achieve a minimum score of 50% in the Water, Energy, Stormwater, and IEQ categories in addition to scoring a minimum of 50% overall. The score that this proposed development is seeking to achieve in BESS is summarised in the table below. Refer to Appendix B for full BESS Assessment.

BESS Assessment Score		
Category	Required Score	Score
Management	0%	62%
Water	50%	50%
Energy	50%	50%
Stormwater	50%	100%
IEQ	50%	63%
Transport	0%	0%
Waste	0%	50%
Urban Ecology	0%	28%
Innovation	0%	20%
<b>Overall Score</b>	<b>50%</b>	<b>51%</b>

## 4. BCA Section J Compliance

The project will be designed in accordance with the Section J Energy Efficiency requirements of the BCA. The energy efficiency requirements apply to the conditioned areas of a building to ensure adequate thermal comfort conditions can be maintained within said space.

Section J compliance assessment will be carried out in the next design stage of the project. In addition, the project must also comply with relevant prescriptive requirements of Section J. The findings of this assessment will be issued in a dedicated report to the Building Surveyor to formally demonstrate compliance.

### 4.1 Approach

All conditioned (heated or cooled) areas including hotel rooms, retail spaces and conditioned common areas of the project are required to comply with the thermal performance requirements of Section J 2019.

In order to demonstrate section J compliance, the conditioned areas will be assessed in accordance with the energy modelling provisions of an Alternative Solution, known as a JV3 Performance Solution assessment.

A Performance Solution is based on assessing the carbon emissions of a proposed building against that of a reference building. This involves detailed simulation modelling of the proposed buildings to provide a holistic assessment of the building's energy efficiency in accordance with the requirements of Section J of the BCA. This method of compliance provides much higher levels of flexibility in the design of a building's envelope.

JV3 report shall be completed prior to construction and form part of the tender documentation. The JV3 report shall include the following as a minimum:

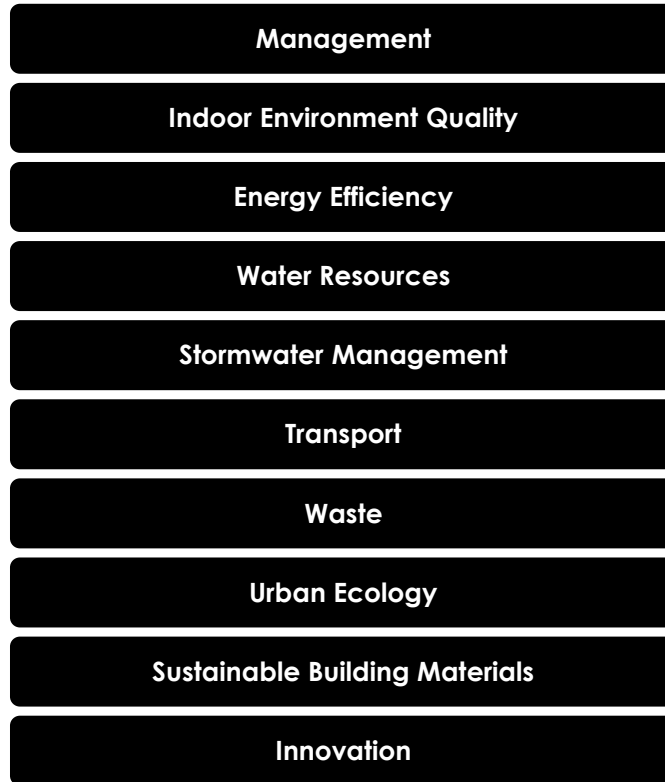
- Detailed building fabric thermal requirements
- Summarise GHG emissions reductions from building fabric, services design and any onsite energy generation if applicable.

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## 5. Sustainability Management Plan

In line with the sustainability commitments and vision for this proposed amended development, the sustainability management plan has been broken into 10 major categories.



These categories provide the framework to create a development with a holistic and thorough approach to environmental sustainability. The project design details have been carefully reviewed and curated to address each category and provide innovative solutions wherever applicable.

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## 5.1 Management

In order to create an integrated design and construction process which in turn leads to effective operational and on-going building performance, the proposed amended development seeks to address this category through the following on-site initiatives.

### BUILDING INFORMATION

- A simple easy-to-use **Building Users Guide** is to be developed and issued to building occupants. The users guide shall include overall description of the ESD features of the building, descriptions of the systems installed and correct operation of the building system. This shall form part of the operation and maintenance manual as part of the handover documentation pack.

### THERMAL PERFORMANCE MODELLING

- **Preliminary Part J assessment** have been undertaken for the building – please refer to Appendix A for results.

### METERING & MONITORING

- **Separate utility meters** will be provided for each major services/system to give the ability to monitor water and electricity usage and consumption.

## 5.2 Indoor Environmental Quality

Indoor Environment Quality (IEQ) has been defined as a key sustainable building category in order to improve indoor environments for building occupants which in turn aims to improve their overall wellbeing. Australians spend **90% or more** of their time indoors. Therefore, consideration to improving indoor environmental quality is a vital step within the design process for any modern building. The proposed amended development seeks to improve the overall Indoor Environmental Quality (IEQ) for building occupants by addressing the following elements:

### INDOOR AIR QUALITY

- The **ventilation system** will comply with ASHRAE Standard 62.1 in regards to minimum separation distances between pollution sources & outdoor air intakes.
- **Mechanically ventilated spaces** shall have increased outside air rates of 100% outside air to the basketball court. The mechanical systems shall have heat recovery to capture and recycle any heat from the building. *This is equivalent to a mechanical design criterion of a maximum CO<sub>2</sub> concentration of 400 ppm.*

### ACCESS TO DAYLIGHT

- Glazing will be selected to maximise access to daylight while prioritising thermal performance necessary to achieve the targeted energy consumption outcomes. Glazing will have a **minimum VLT of 50%** given that the thermal performance required is achieved. Note that the building will not be able to meet the BESS daylight criteria due to the nature of an indoor basketball court and has been scoped out from the BESS assessment.

### INDOOR POLLUTANTS

- **Low Volatile Organic Compounds (VOC)** internally applied paints, carpets, adhesives and sealants will be selected for the project.
- **Low Formaldehyde** engineered wood products (particleboard, plywood, MDF) will be selected for the project.

## 5.3 Energy Efficiency

The built environment within Australia contributes over **40%** of our total greenhouse gas emissions annually which is among the highest per capita in the world. **Intelligent design** can drastically improve energy efficiency and decrease greenhouse gas emissions associated with a building's operation. This development has sought to include several sustainable initiatives designed in order to maximise the energy efficiency of the development. Energy efficiency initiatives proposed for inclusion within the development are outlined below:

### BUILDING FABRIC

- Subject to detailed design and final thermal performance analysis, the project is shall target a **10% improvement over a reference building.**

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- **Double glazing** will be used throughout the project.
- Considered specification of **construction materials and external cladding** to maximise positive influence of thermal mass and minimise unwanted heat gain/loss. This includes the use of concrete slab floors.

## APPLIANCES & EQUIPMENT

- All **building service will be electric** in order to eliminate reliance on fossil fuels.
- A high efficiency centralised **Electric heat pump system** will be installed to minimise greenhouse gas emissions from the **domestic hot water** demand from the facility.
- **Full air conditioning** will only be provided to critical occupied zones
- **Basketball Court zone will be provided with tempered air only to maintain wider temperature comfort band of 27C in summer and 17C in winter.** Heat recovery system will be provided to capture any waste heat.
- Where air conditioning is provided, it will be via **inverter Split or VRV/VRF** units with good energy efficiency. Minimum COPs of 3.5 for cooling and heating shall be applied.

## SUSTAINABLE ENERGY SUPPLY

- The school has an **existing PV array** installed which will supplement the schools' total energy use. Any other opportunity to increase the PV capacity on the proposed building will be reviewed subject to approval from the local energy authority. No additional PV forms part of this planning approval process due to the unknown nature of the approval process.
- Electricity generated from the PV system will be directly supplied to the building and school campus. Where PV supply is not available, the development will rely on grid electricity.
- The option of **Certified Greenpower** to be explored in design development with the energy provider.

## LIGHTING

- Energy efficient **LED** will be installed throughout.
- The **lighting power density** will be reduced by at least 10% below the maximum lighting power density allowable in Table J6.2a. Independent light switching will be provided to each functional room.
- Where practical, **external lighting** will be provided with motion sensors and/or timers. In order to improve safety of the development and allow for natural surveillance, some energy efficient external lighting may be provided and maintained when necessary.

## COMMISSIONING

- The building shall be commissioned to ensure the building system operate as intended. Commissioning shall include operation and maintenance training to the facility managers to ensure future operation and maintenance regimes are understood and carried out. This responsibility shall lie with the commissioning engineers and handover process.

## 5.4 Water Resources

Water saving measures such as water efficient fittings and fixtures (taps, shower heads etc.) and reuse systems are key features for water efficient design. Overall, the project will seek to address water efficiency and reduce the potable water demand for the building through the below initiatives.

### WATER CONSERVATION

- **Sanitary fixtures** across all the development will meet the WELS rating below:
  - Taps –6 Star Kitchen Taps; 6 Star Basin taps
  - Toilets – 4 Star
  - Urinals – 6 Star
  - Showers 4 Star (<=6.0 L/min)
  - Dishwashers – Not applicable
  - Clothes washing machines – Not applicable
- There will be no wet **fire protection system**.

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- **Drip irrigation** with moisture sensor override will be installed. The landscaping and associated systems will be designed to reduce the consumption of potable water required for irrigation through the installation of subsoil drip irrigation and moisture sensor controls.

#### WATER REUSE

- **Rainwater** will be collected and **re-used for irrigation** and grounds keeping washdown via a 30KL rainwater tank.

## 5.5 Stormwater Management

The design team recognizes and embraces that by reducing stormwater run-off from the site the project has the potential to improve natural ecosystem health and improve natural ecology beyond the site boundary. Measures taken to reduce stormwater runoff include WSUD design principles.

#### WATER SENSITIVE URBAN DESIGN (WSUD)

- The project will comply with WSUD requirements via the rainwater reuse system & storm water treatment devices that will achieve a compliant outcome via MUSIC modelling.
- The WSUD strategy involves 30kL Rainwater tank collecting stormwater from the roof with a total catchment area of approx. 1200 m<sup>2</sup> and supplying water to the school irrigation system to irrigate approximately 1000m<sup>2</sup> of landscaping area. Remaining catchment areas from general road and circulation shall drain to the treatment devices prior to discharge to storm drain.
- Please refer to Water Sensitive Urban Design Report (WSUD) by TTW

## 5.6 Transport

The new building utilises the schools existing transport infrastructure and arrangements. No further initiatives will be applicable to the development of this building.

## 5.7 Waste

Construction and demolition activities account for a large percentage of the waste and recycling generated by a site when compared to its general operation. There is now a growing level of interest in 'green' buildings, which through careful design use less resources and energy than conventional buildings and provide healthier environments for staff.

#### CONSTRUCTION AND DEMOLITION WASTE

- The head contractor will commit to divert at least **80%** of the waste generated during **construction and demolition** from landfill.

#### OPERATIONAL WASTE

- The proposed building will adhere to the school's waste management policy with a waste management plan prepared under separate cover.

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## 5.8 Urban Ecology

In order to protect and enhance the local biodiversity and urban ecology, the development seeks to address this ESD category through the following on-site initiatives.

### SITE VEGETATION

- The project will incorporate landscaping to a minimum of **5% of the site** area to provide improved amenity.

## 5.9 Sustainable Building Materials

A significant amount of material is expected to be used within the development. Embodied energy is often a key consideration overlooked in material selection. The proposed amended development seeks to address and manage the selection and specification of sustainable building materials.

### MATERIAL REDUCTION

- The selection of a **limited materials palette**, along with a focus on raw finishes, aims to reduce total material usage in the project.

### HEALTHY MATERIALS SPECIFICATION

- During the project's detailed design phase all materials will be evaluated regarding their potential toxicity. This will result in the specification of **low or zero VOC** paints, materials, adhesives and finishes throughout. Refer to Appendix D for VOC limits and standards
- Selections for permanent formwork, pipes, flooring, blinds and cables will be either PVC free products or meet **PVC Best Practice Guidelines**.

### RECLAIMED OR RECYCLED MATERIALS

- Opportunities to use **reclaimed or recycled materials** shall be investigated.

### LOW IMPACT MATERIALS

- Subject to structural engineering requirements, the project will specify recycled content (fly ash or furnace slag) in **structural concrete**.
- All new **timber** used in the project will be **FSC or AFC certified**.
- All reinforcing steel to be from best Practise Steel produced using energy-reducing processes and be a member of the ASI Environmental Sustainability Charter Group

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# Appendix A – Indicative Part J Requirements

Proposed Typical Building Fabric is estimated to be:

Walls: R2.5 insulation

Roof: R3.0 insulation

Glazing Typical– U-value 3.5 W/m<sup>2</sup>.K, SHGC 0.30 to 0.40 (High Quality DGU window system with solar control glass)

Assumed a concrete frame construction.

*Final JV3 energy modelling report detailing building fabric and services energy performance shall be carried out as part of design development and to form part of the tender documentation package.*

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## Appendix B – BESS Assessment

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# BESS Report

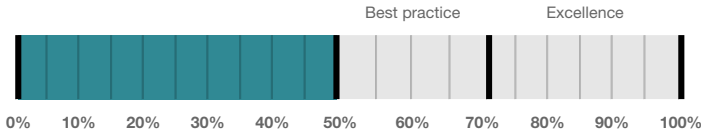
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 517 Orrong Rd Armadale VIC 3143. 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 Stonnington 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



# 51%

## Project details

**Address** 517 Orrong Rd Armadale VIC 3143  
**Project no** 754D33C8-R2  
**BESS Version** BESS-6

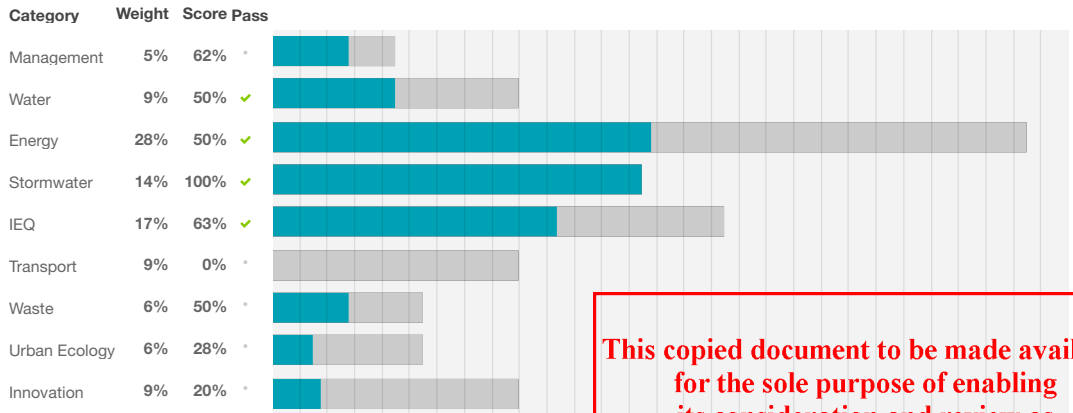
**Site type** Non-residential development  
**Account** kenneth.yuen@wge.com.au  
**Application no.**  
**Site area** 2,000 m<sup>2</sup>  
**Building floor area** 1,737.0 m<sup>2</sup>  
**Date** 16 December 2021  
**Software version** 1.7.0-B.375

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## Performance by category

● Your development ● Maximum available



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## Buildings

Name	Height	Footprint	% of total footprint
Sports Centre	1	1,600 m <sup>2</sup>	100%

## Dwellings & Non Res Spaces

### Non-Res Spaces

Name	Quantity	Area	Building	% of total area
<b>Other building</b>				
Sports Centre	1	1,737 m <sup>2</sup>	Sports Centre	100%
<b>Total</b>	<b>1</b>	<b>1,737 m<sup>2</sup></b>	<b>100%</b>	

## Supporting information

### Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.2	Individual utility meters annotated		-
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)	To be printed See Architectural Drawings	✓
Waste 2.2	Location of recycling facilities		-
Urban Ecology 2.1	Vegetated areas	To be printed Refer to Landscape Drawings	✓
Urban Ecology 2.3	Green facade	To be printed Refer to Landscape Drawings	✓

### Supporting evidence







Credit	Requirement	Response	Status
Management 2.3a	Section J glazing assessment		-
Management 2.3b	Preliminary modelling report		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.7	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Stormwater 1.1	STORM report or MUSIC model	To be printed STORM report See STORM report	✓

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## Credit summary













### Management Overall contribution 4.5%

		<b>62%</b>
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		100%
3.2 Metering		100%
3.3 Metering		100%
4.1 Building Users Guide		100%

### Water Overall contribution 9.0%


		<b>Minimum required 50%</b>	<b>50%</b>	<b>✓ Pass</b>
1.1 Potable water use reduction		40%		
3.1 Water Efficient Landscaping		100%		
4.1 Building Systems Water Use Reduction		N/A	✦ Scoped Out	
No Sprinklers				

### Energy Overall contribution 27.5%


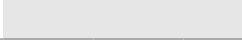




		<b>Minimum required 50%</b>	<b>50%</b>	<b>✓ Pass</b>
1.1 Thermal Performance Rating - Non-Residential		12%		
2.1 Greenhouse Gas Emissions		100%		
2.2 Peak Demand		100%		
2.3 Electricity Consumption		100%		
2.4 Gas Consumption		N/A	✦ Scoped Out	
No gas connection in use				
3.1 Carpark Ventilation		N/A	✦ Scoped Out	
No enclosed Car park				
3.2 Hot Water		100%		
3.7 Internal Lighting - Non-Residential		100%		
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A	✦ Scoped Out	
No cogeneration or trigeneration system in use.				
4.2 Renewable Energy Systems - Solar		N/A	⊘ Disabled	
No solar PV renewable energy is in use.				
4.4 Renewable Energy Systems - Other		N/A	⊘ Disabled	
No other (non-solar PV) renewable energy is in use.				

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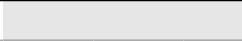
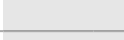

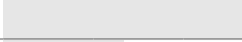


**Stormwater Overall contribution 13.5%**

	<b>Minimum required 100%</b>	<b>100%</b>	<b>✓ Pass</b>
1.1 Stormwater Treatment		100%	


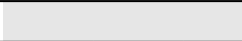
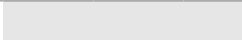

**IEQ Overall contribution 16.5%**

	<b>Minimum required 50%</b>	<b>63%</b>	<b>✓ Pass</b>
1.4 Daylight Access - Non-Residential		N/A	✦ Scoped Out
Project is a Basketball Court - Daylight is not a critical parameter			
2.3 Ventilation - Non-Residential		100%	✓ Achieved
3.4 Thermal comfort - Shading - Non-residential		0%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1 Air Quality - Non-Residential		100%	

**Transport Overall contribution 9.0%**

		<b>0%</b>	
1.4 Bicycle Parking - Non-Residential		0%	
1.5 Bicycle Parking - Non-Residential Visitor		0%	
1.6 End of Trip Facilities - Non-Residential		N/A	⊗ Disabled
Credit 1.4 must be complete first.			
2.1 Electric Vehicle Infrastructure		0%	
2.2 Car Share Scheme		N/A	✦ Scoped Out
School projects has no scope for a car share services			
2.3 Motorbikes / Mopeds		0%	

**Waste Overall contribution 5.5%**

		<b>50%</b>	
1.1 - Construction Waste - Building Re-Use		N/A	✦ Scoped Out
no building existing building on site			
2.1 - Operational Waste - Food & Garden Waste		0%	
2.2 - Operational Waste - Convenience of Recycling		100%	

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**Urban Ecology Overall contribution 5.5%**

		<b>28%</b>
1.1 Communal Spaces		N/A ✦ Scoped Out
Project is a School grounds - entire site is a leisure /communal zone		
2.1 Vegetation		25%
2.2 Green Roofs		0%
2.3 Green Walls and Facades		100%
3.2 Food Production - Non-Residential		0%

**Innovation Overall contribution 9.0%**

		<b>20%</b>
1.1 Innovation		20%

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## Credit breakdown

### Management Overall contribution 3%

<b>1.1 Pre-Application Meeting</b>	0%
Score Contribution	This credit contributes 37.5% towards the category score.
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?
Question	Criteria Achieved ?
Project	-
<b>2.3 Thermal Performance Modelling - Non-Residential</b>	100%
Score Contribution	This credit contributes 25.0% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?
Question	Criteria Achieved ?
Other building	Yes
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Other building	Yes
<b>3.2 Metering</b>	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have utility meters been provided for all individual commercial tenants?
Question	Criteria Achieved ?
Other building	Yes
<b>3.3 Metering</b>	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Other building	Yes
<b>4.1 Building Users Guide</b>	100%
Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

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**Water** Overall contribution 4% Minimum required 50%

<b>Water Approach</b>	
What approach do you want to use for Water?:	Use the built in calculation tools
<b>Project Water Profile Question</b>	
Do you have a reticulated third pipe or an on-site water recycling system?:	-
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
<b>Water fixtures, fittings and connections</b>	
Building:	Sports Centre
Showerhead:	4 Star WELS (>= 4.5 but <= 6.0)
Bath:	Scope out
Kitchen Taps:	>= 6 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	Scope out
WC:	>= 4 Star WELS rating
Urinals:	>= 6 Star WELS rating
Washing Machine Water Efficiency:	Scope out
Which non-potable water source is the dwelling/space connected to?:	-1
Non-potable water source connected to Toilets:	No
Non-potable water source connected to Laundry (washing machine):	No
Non-potable water source connected to Hot Water System:	No
<b>Rainwater Tank</b>	
What is the total roof area connected to the rainwater tank?: Rain Water Tank	13,000 m <sup>2</sup>
Tank Size: Rain Water Tank	20,000 Litres
Irrigation area connected to tank: Rain Water Tank	5,000 m <sup>2</sup>
Is connected irrigation area a water efficient garden?: Rain Water Tank	Yes
Other external water demand connected to tank?: Rain Water Tank	-

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<b>1.1 Potable water use reduction</b>		40%
Score Contribution	This credit contributes 83.3% towards the category score.	
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.	
Output	Reference	
Project	5298 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	4141 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	3557 kL	
Output	% Reduction in Potable Water Consumption	
Project	32 %	
Output	% of connected demand met by rainwater	
Project	26 %	
Output	How often does the tank overflow?	
Project	Very Often	
Output	Opportunity for additional rainwater connection	
Project	835 kL	
<b>3.1 Water Efficient Landscaping</b>		100%
Score Contribution	This credit contributes 16.7% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	
<b>4.1 Building Systems Water Use Reduction</b>		N/A  Scoped Out
This credit was scoped out	No Sprinklers	

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**Energy** Overall contribution 14% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	No
<b>Non-Residential Building Energy Profile</b>	
Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	100 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	100 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	90.0 kWh
Heating - Wood - reference fabric and reference services:	0.0 MJ
Heating - Wood - proposed fabric and reference services:	0.0 MJ
Heating - Wood - proposed fabric and proposed services:	0.0 MJ
Hot Water - Electricity - Baseline:	100 kWh
Hot Water - Electricity - Proposed:	80.0 kWh
Lighting - Baseline:	100 kWh
Lighting - Proposed:	85.0 kWh
Peak Thermal Cooling Load - Baseline:	100 kW
Peak Thermal Cooling Load - Proposed:	90.0 kW
<b>1.1 Thermal Performance Rating - Non-Residential</b>	12%
Score Contribution	This credit contributes 44.4% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
<b>2.1 Greenhouse Gas Emissions</b> 100%	
Score Contribution	This credit contributes 11.1% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Other building	204 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Other building	173 kg CO2
Output	% Reduction in GHG Emissions
Other building	15 %
<b>2.2 Peak Demand</b> 100%	
Score Contribution	This credit contributes 5.6% towards the category score.
Criteria	What is the % reduction in instantaneous (peak-hour) demand against the benchmark?
Output	Peak Thermal Cooling Load - Baseline
Other building	100 kW
Output	Peak Thermal Cooling Load - Proposed
Other building	90.0 kW
Output	Peak Thermal Cooling Load - % Reduction
Other building	10 %

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<b>2.3 Electricity Consumption</b>		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Other building	200 kWh	
Output	Proposed	
Other building	170 kWh	
Output	Improvement	
Other building	15 %	
<b>2.4 Gas Consumption</b>		N/A ✦ Scoped Out
This credit was scoped out	No gas connection in use	
<b>3.1 Carpark Ventilation</b>		N/A ✦ Scoped Out
This credit was scoped out	No enclosed Car park	
<b>3.2 Hot Water</b>		100%
Score Contribution	This credit contributes 5.6% towards the category score.	
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?	
Output	Reference	
Other building	100 kWh	
Output	Proposed	
Other building	80.0 kWh	
Output	Improvement	
Other building	19 %	
<b>3.7 Internal Lighting - Non-Residential</b>		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1?	
Question	Criteria Achieved ?	
Other building	Yes	
<b>4.1 Combined Heat and Power (cogeneration / trigeneration)</b>		N/A ✦ Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.	
<b>4.2 Renewable Energy Systems - Solar</b>		N/A ⓪ Disabled
This credit is disabled	No solar PV renewable energy is in use.	
<b>4.4 Renewable Energy Systems - Other</b>		N/A ⓪ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.	

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**Stormwater** Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:		Melbourne Water STORM tool
<b>1.1 Stormwater Treatment</b>		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	100	
Output	Min STORM Score	
Project	100	

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

**Transport** Overall contribution 0%

**1.4 Bicycle Parking - Non-Residential** 0%

Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Other building	No
Question	Bicycle Spaces Provided ?
Other building	-

**1.5 Bicycle Parking - Non-Residential Visitor** 0%

Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?
Question	Criteria Achieved ?
Other building	No
Question	Bicycle Spaces Provided ?
Other building	-

**1.6 End of Trip Facilities - Non-Residential** N/A  Disabled

This credit is disabled Credit 1.4 must be complete first.

**2.1 Electric Vehicle Infrastructure** 0%

Score Contribution	This credit contributes 28.6% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	No

**2.2 Car Share Scheme** N/A  Scoped Out

This credit was scoped out School projects has no scope for a car share services

**2.3 Motorbikes / Mopeds** 0%

Score Contribution	This credit contributes 14.3% 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

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**Waste** Overall contribution 3%

<b>1.1 - Construction Waste - Building Re-Use</b>		N/A	✦ Scoped Out
This credit was scoped out	no building existing building on site		
<b>2.1 - Operational Waste - Food &amp; Garden Waste</b>		0%	
Score Contribution	This credit contributes 50.0% towards the category score.		
Criteria	Are facilities provided for on-site management of food and garden waste?		
Question	Criteria Achieved ?		
Project	No		
<b>2.2 - Operational Waste - Convenience of Recycling</b>		100%	
Score Contribution	This credit contributes 50.0% towards the category score.		
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?		
Question	Criteria Achieved ?		
Project	Yes		

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## Urban Ecology Overall contribution 2%

<b>1.1 Communal Spaces</b>	N/A	✦ Scoped Out
This credit was scoped out	Project is a School grounds - entire site is a leisure /communal zone	
<b>2.1 Vegetation</b>	25%	
Score Contribution	This credit contributes 57.1% towards the category score.	
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?	
Question	Percentage Achieved ?	
Project	5 %	
<b>2.2 Green Roofs</b>	0%	
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Does the development incorporate a green roof?	
Question	Criteria Achieved ?	
Project	No	
<b>2.3 Green Walls and Facades</b>	100%	
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Does the development incorporate a green wall or green façade?	
Question	Criteria Achieved ?	
Project	Yes	
<b>3.2 Food Production - Non-Residential</b>	0%	
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Other building	0.0 m <sup>2</sup>	
Output	Min Food Production Area	
Other building	22 m <sup>2</sup>	

## Innovation Overall contribution 2%

<b>Innovation</b>	
<b>Description:</b> Net Zero	School will adopt a Net Zero policy for the operational energy
<b>Points Targeted:</b> Net Zero	2
<b>1.1 Innovation</b>	20%
Score Contribution	This credit contributes 100.0% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

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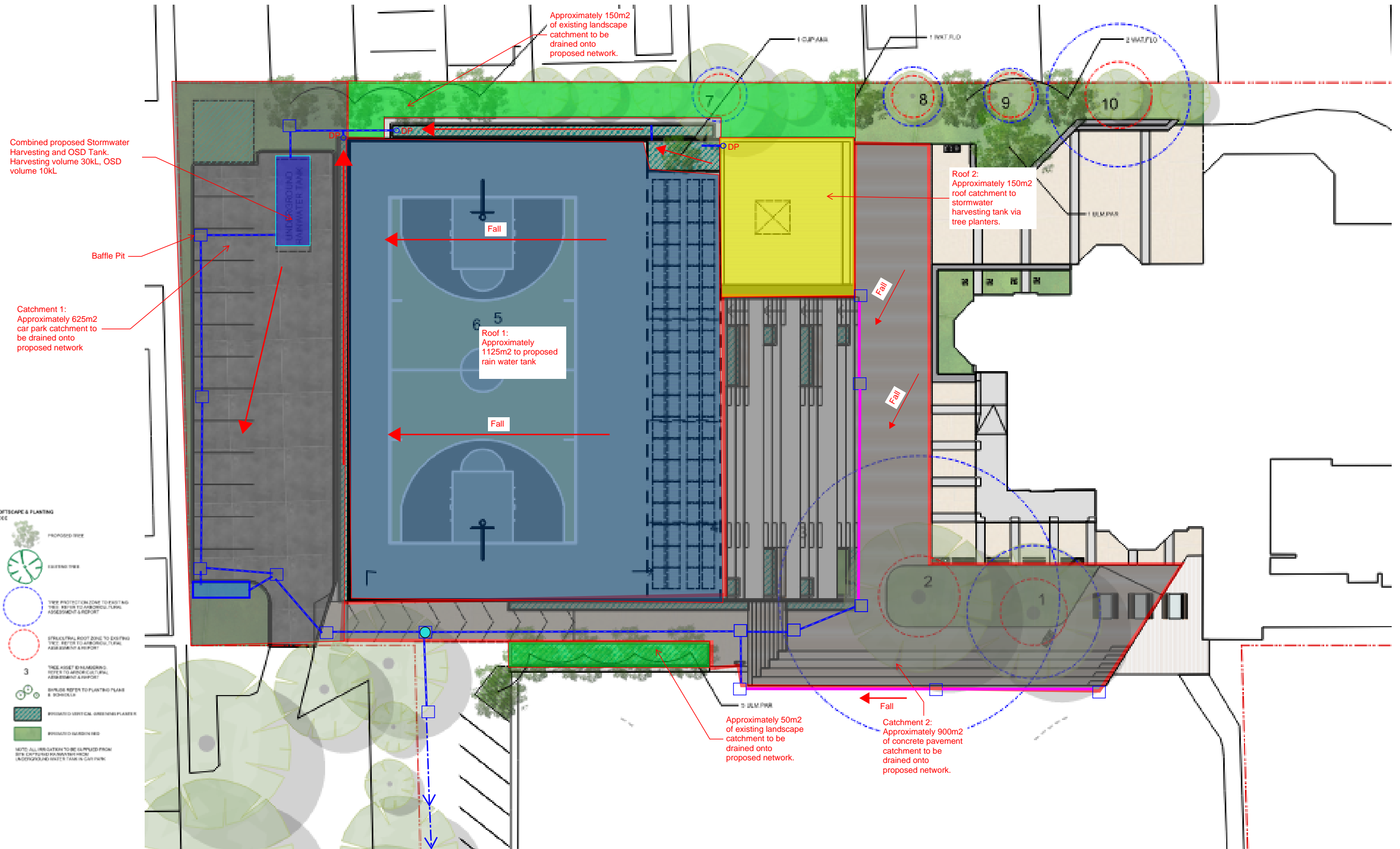
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# Appendix C – Rain Water Catchment Plan

*Proposed catchment plan is extracted from WSUD report by TWW dated 24.03.22. Please refer to WSUD report for details on the overall WSUD strategy.*

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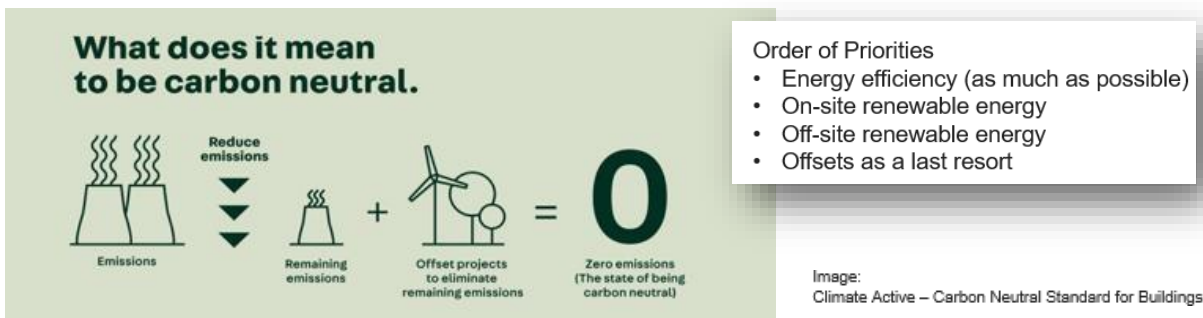
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## Appendix D - Carbon Neutral Pathway

What is Carbon Neutral?

'Carbon neutral means reducing emissions where possible and compensating for the remainder by investing in carbon offset projects to achieve net zero overall emissions.' (as defined by Climate Active)

Climate Active is the only government accredited carbon neutral certification scheme in Australia. Climate Active certification is awarded to organisations, buildings, precincts, products and events that have credibly reached a state of achieving net zero emissions, otherwise known as 'carbon neutral'.



What's included?

The GHG emissions associated with the below elements (Quantified + Non-Quantified) are included in a Carbon Neutral certification.

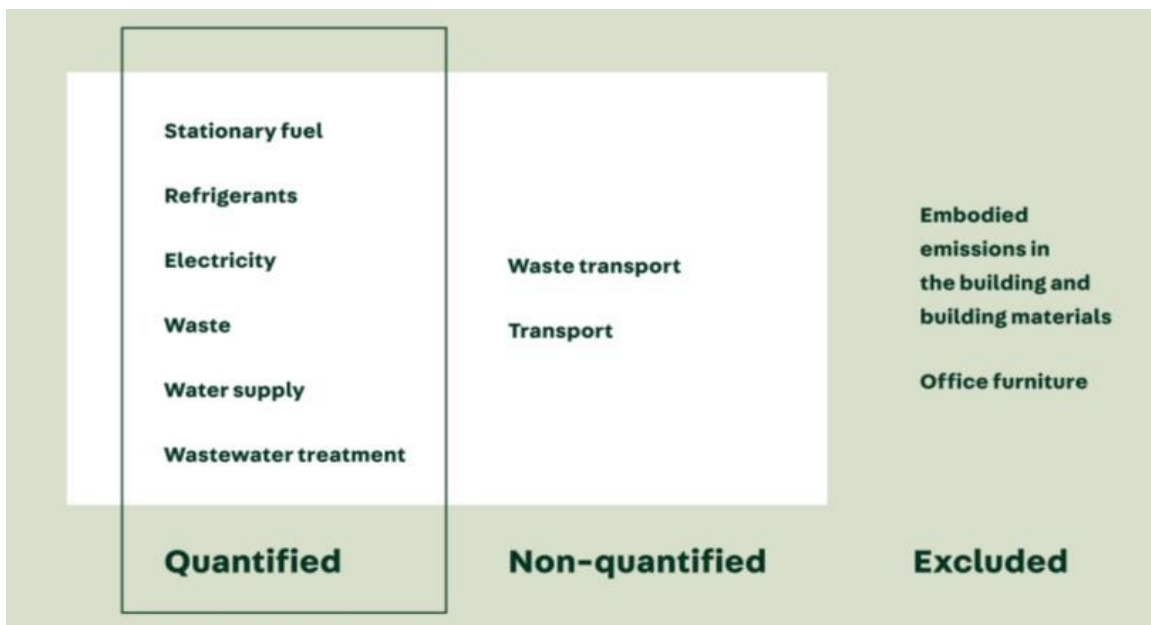


Image: Climate Active – Carbon Neutral Standard for Buildings

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What is the process?

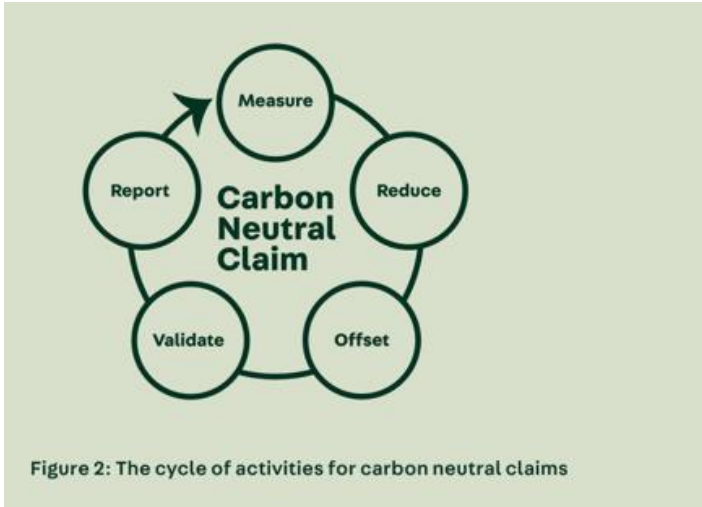


Figure 2: The cycle of activities for carbon neutral claims

Image: Climate Active – Carbon Neutral Standard for Buildings

The pathway is a process of quantifying the carbon emission from the operations of the building, account for any onsite energy renewable generation, green power, implement methods to reduce energy and carbon emissions and offset the remaining balance through purchasing carbon offsets.

Stantec can assist this process when the building is operational and provide feasibility assessments & guide the certification process through its Climate Active accredited professionals.

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## Appendix E – VOC limits

VOC limits shall be based on Green Star Design and As built V1.3 See extracts below

Table 13.1.1B: Maximum TVOC Limits for Paints, Adhesives and Sealants

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
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

Table 13.1.2B Carpet Test Standards and TVOC Emissions Limits

Compliance option	Test protocol	Limit
ASTM D5116	ASTM D5116 - Total VOC limit*	0.5mg/m <sup>2</sup> per hour
	ASTM D5116 - 4-PC (4-Phenylcyclohexene)*	0.05mg/m <sup>2</sup> per hour
ISO 16000 / EN 13419	ISO 16000 / EN 13419 - TVOC at three days	0.5 mg/m <sup>2</sup> per hour
ISO 10580 / ISO/TC 219 (Document N238)	ISO 10580 / ISO/TC 219 (Document N238) - TVOC at 24 hours	0.5mg/m <sup>2</sup> per hour

\*Both limits should be met when testing against ASTM D5116

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Table 13.2B: Formaldehyde Emission Limit Values for Engineered Wood Products

Test Protocol	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/m <sup>2</sup> hr*
ASTM D5116 (applicable to high pressure laminates and compact laminates)	≤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	≤0.1 mg/m <sup>2</sup> hr (at 3 days)
ASTM D6007	≤0.12mg/m <sup>3</sup> **
ASTM E1333	≤0.12mg/m <sup>3</sup> ***
EN 717-1 (also known as DIN EN 717-1)	≤0.12mg/m <sup>3</sup>
EN 717-2 (also known as DIN EN 717-2)	≤3.5mg/m <sup>2</sup> hr

\*mg/m<sup>2</sup>hr may also be represented as mg/m<sup>2</sup>/hr.

\*\*The test report must confirm that the conditions of Table 3 comply for the particular wood product type, the final results must be presented in EN 717-1 equivalent (as presented in the table) using the correlation ratio of 0.98.

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