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PLC Sports, Aquatic and Fitness Centre

Sustainability Management Plan

Prepared for: Root Partnerships

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Date: 18 October 2021

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Revision

Revision	Date	Comment	Prepared By	Approved By
01	25/10/2019	Issue for Review	MRD	POB
02	15/05/2020	Issue for Town Planning	MRD	POB
03	15/10/2021	Issue for Town Planning	MVS	POB
04	18/10/2021	Issue for Town Planning	MVS	POB

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Design with **community** in mind

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 warrantee 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 Root Partnerships and is intended to provide an overview of the Environmentally Sustainable Design (ESD) initiatives in support of the Planning Permit application for the proposed development at Presbyterian Ladies' College, 141 Burwood Highway, Burwood.

This Sustainability Management Plan (SMP) has been prepared to inform Whitehorse City Council of the proposed development's commitment to sustainability, measured against the documented performance guidelines in accordance with Whitehorse 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 a state-of-the-art Sports, Aquatic and Fitness Centre (SAFC) that not only provides an exceptional learning and competition space for the students, but also exceeds standard benchmarks with regards to sustainability. The project will aim to minimise water and energy consumption through efficient design and seek to incorporate innovative and effective sustainability strategies wherever possible.

The project is targeting:

- Best Practice Environmentally Sustainable Design through the use of BESS (minimum 50% score)
- Passive design to achieve a minimum 15% improvement on NCC 2019 Section J requirements

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

- **Fossil fuel free** building, utilising no on-site combustion of fossil fuels, implementing extensive on-site renewable energy systems, and 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 inhabitants from extreme weather events.
- Create a **healthy indoor environment**, 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**.
- Promote **urban ecology**.

1.1 Policy Requirements

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

- Whitehorse Planning Scheme – Clause 22.10 Environmentally Sustainable Development
- ABCB National Construction Code (NCC) 2019

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2. Project Information

2.1 Project Overview

Presbyterian Ladies' College in Burwood has proposed to develop a new Sports, Aquatic and Fitness Centre in order to meet the needs of their students and provide a state-of-the-art facility for years to come. The facility will include an Olympic sized swimming pool, diving pools, a learn-to-swim pool, basketball and multi-use indoor courts, a gymnastics centre, and other multi-use rooms for activities such as pilates, yoga, spin classes, etc. The facility will also include office space for the Sports and Recreation staff and adequate change, shower, and locker facilities.

2.2 Development Summary

The proposed built form can be summarised as follows:

Floor Level	Description
Ground	Entrance lobby and lounge, 50m swimming pool, diving pool, learn-to-swim pool, staff areas, shared car parking facility, bicycle storage, multipurpose room and gymnastics space
Levels 1	Basketball and multi-use indoor courts, fitness spaces
Levels 2	Sport staff offices and meeting rooms

2.3 Project Site

The proposed development has a total building footprint of approximately **8,250 m²**. The total project site is estimated to be 13,870m², inclusive of upgrades to surrounding pavement and landscaping. The subject site for the proposed building is shown in the image below.



2.4 Design Documentation

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

- Architectural Drawings – Warren and Mahoney – Town Planning Issue - 02/09/2021

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3. Summary of Sustainability Commitments

3.1 Sustainability Vision

The development of the Sports, Aquatic and Fitness Centre at Presbyterian Ladies' College aims to encourage the use of sustainable practises through high quality energy efficient building fabric and system design, effective Water Sensitive Urban Design (WSUD), landscape revegetation, existing tree retention and 2:1 tree planting offset for trees lost, and water conservation and reuse strategies.

3.2 Sustainability Commitments & Targets

Sustainability is a fundamental guiding principle embedded in the development of the Sports and Aquatic Centre at Presbyterian Ladies' College. The project will achieve the following key targets:

- Development to commit to achieve **Best Practice (minimum 50%)**
- Development to achieve a minimum **15% improvement on NCC 2019 energy efficiency standards**

3.2.1 Built Environment Sustainability Scorecard (BESS)

In addition to the sustainable design elements nominated above, the 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 development has achieved in BESS is summarised in the table below:

BESS Assessment Score		
Category	Required Score	Score
Management	0%	57%
Water	50%	57%
Energy	50%	60%
Stormwater	50%	100%
IEQ	50%	55%
Transport	0%	77%
Waste	0%	66%
Urban Ecology	0%	50%
Innovation	0%	50%
Overall Score	50%	64%

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3.2.2 Improvement on NCC Energy Efficiency Standards

The National Construction Code (NCC) requires a building to meet minimum energy efficient requirements and prove compliance via a Deemed-to-Satisfy (DtS) or Performance Solution. A verification method can be used as a means of demonstrating that a Performance Solution complies with the relevant requirements. Verification Method JV3 requires a Class 3, 5, 6,7,8, or 9 building to have calculated annual energy consumption not more than that predicted by computer simulation for a building built using DtS Provisions. For this project, energy consumption will be reduced by at least 20% compared to an NCC 2016 reference case building, which complies with the DtS Provisions, as calculated using JV3 modelling software.

The building will comply with NCC 2019 Section J Energy Efficiency standards and will achieve a minimum 15% reduction on modelled energy consumption when compared to a NCC 2016 reference building. The improvement on an NCC 2016 reference case has been stated because this is the Benchmark used to calculate the Energy score in BESS.

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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 aquatic centre, learning spaces and conditioned common areas of the project are required to comply with the thermal performance requirements of Section J (2019).

It is anticipated that in the next design stages the project team will opt to demonstrate Section J compliance via a Performance Solution. Under this Pathway, 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 energy performance 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.

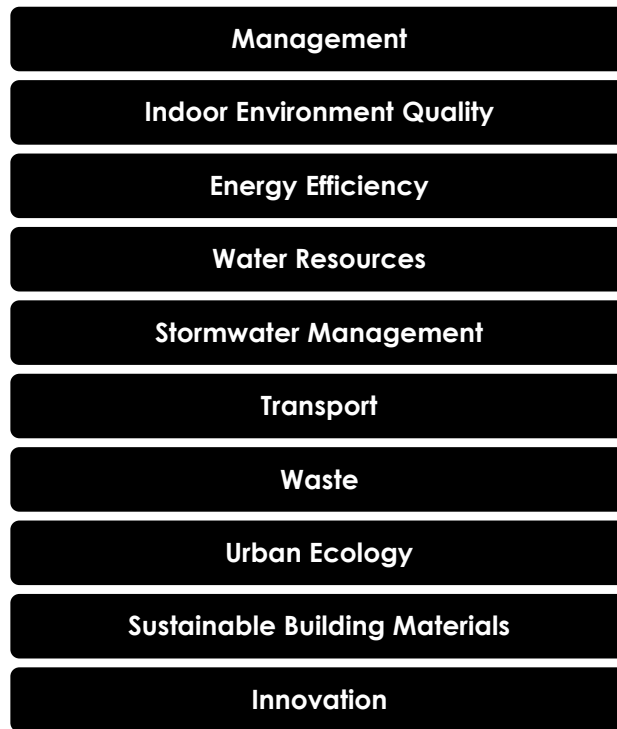
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5. Sustainability Initiatives

In line with the sustainability commitments and vision for this 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.

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 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.

THERMAL PERFORMANCE MODELLING

- A preliminary Section J Assessment has been undertaken to better understand the thermal performance of the building based on the building envelope.

METERING & MONITORING

- **Submetering of electricity and water** will be provided for the major consumers to give facility management the ability to monitor their water and electricity consumption.

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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 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 AS 1668.2-2012 in regards to outdoor air ventilation rates. The Aquatic centre will utilise a 100% outdoor air system providing high quality air to the space.
- Operable windows and **cross flow strategies** shall be employed in the indoor courts with the aim of maximising fresh air intake and reducing the need for mechanical ventilation, thus lowering overall energy use.
- All **kitchens, bathrooms and print areas will be ventilated** in accordance with AS 1668.2-2012. A separate exhaust system will be provided for the kitchen exhaust.
- All **pollutants from vehicles** in an enclosed space will be exhausted to a dedicated exhaust riser or directly to the outside, in accordance with Section 4 of AS 1668.2-2012. This exhaust system will not recycle air to other enclosures.

ACCESS TO DAYLIGHT

- Building orientation, facade design, glazing and material selection have all been designed with the intent to achieve **natural daylight** to occupied areas while maintaining a high thermal performance.
- Glazing will be selected to maximise access to daylight while prioritising thermal performance necessary to achieve the targeted energy consumption outcomes. The VLT of the selected glazing will be a **minimum of 40%**.
- All regularly occupied areas within the design are afforded **direct access to natural light**. There are no borrowed light spaces within the development.

VISUAL COMFORT

- Glazing design will incorporate features to **reduce glare** where necessary, such as external or internal shading
- All regularly occupied will have a **clear line of sight** to internal or external views.

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.

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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

- The project will achieve compliance with BCA Section J 2019 Energy Efficiency requirements and subject to detailed design and final thermal performance analysis, will target a further **5-10% reduction** in energy consumption when compared to a reference building.
- **Double glazing** will be used throughout the project, including internal windows adjoining the Aquatic centre.
- Teaching and office areas have been **oriented to the North** wherever possible.
- **Operable louvres** are provided to the indoor courts for natural ventilation
- Considered specification of **construction materials and external cladding** to maximise positive influence of thermal mass and minimise unwanted heat gain/loss. This includes exposed concrete ceilings and a combination of insulated precast concrete external walls and insulated lightweight external and party wall construction.
- Provision of a building fabric around the Aquatic centre with **low air permeability** and **thermally broken** framing where considered practical.

APPLIANCES & EQUIPMENT

- The building will achieve a minimum 15% reduction on energy consumption when compared to a NCC 2016 reference building for heating, cooling and ventilation.
- All supplied appliances to be specified **within 1 Star rating** of maximum energy star rating (where available).
- A high efficiency centralised system will be installed to minimise greenhouse gas emissions from the **domestic hot water and space heating and cooling** demand from the facility.
- **Ventilation** and **backwash water heat recovery** will be installed to minimise energy loss.

SUSTAINABLE ENERGY SUPPLY

- A **Rooftop Solar PV** array of **at least 200kW** will be installed on the building to offset grid electricity usage and further reduce GHG emissions associated with the building's operation.
- **100% Certified Greenpower** will be sourced for any off-site electricity demand, as part of the school's 100% Renewable target and agreement with Flow Energy.

LIGHTING

- Energy efficient **LED and fluorescent lighting** will be installed throughout.
- The **lighting power density** will be reduced by >10% when compared to the maximum lighting power density allowable in Table J6.2a (NCC 2019). Independent light switching will be provided to each functional room with motion sensors and/or timers where practical.
- 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.

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CAR PARK VENTILATION

- Car park mechanical systems to include variable speed fan drives and **Carbon Monoxide (CO) monitoring** systems to improve energy efficiency and ensure systems only run when required.

5.4 Water Resources

With people becoming more aware of our water security issues, buildings that are designed to use water more efficiently are highly valued. 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 development 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 be within one star of the WELS rating below:
 - Taps – 6 Star
 - Toilets – 4 Star
 - Showers - 3 Star (>6.0 but <=7.5 L/min); provided on timers
 - Dishwashers – 5 Star (where/if supplied)
 - Clothes washing machines – 5 Star (where/if supplied)
- A **fire protection system** will be designed to include temporary storage for 80% of the routine fire protection system test water and maintenance drain-downs for reuse on-site.
- **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 swimming pool make-up water** via a 350,000L retention 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:

WATER SENSITIVE URBAN DESIGN (WSUD)

- A **WSUD** strategy has been developed for the site, inclusive of MUSIC modelling. The WSUD strategy can be found in the **Stormwater Management Plan**, issued under separate cover. Post development peak event discharge from the site will not exceed the pre-development peak event discharge. All **stormwater discharged** from site will meet the required Pollution Reduction Targets.
- The WSUD strategy involves **350kL retention tank** collecting stormwater from the building roof (8,200m²) for reuse as pool water make up.

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5.6 Transport

The adoption of sustainable transport methods are encouraged by building designs which provide appropriate facilities for occupants and visitors. Site proximity to major transport infrastructure also lends itself to students and visitors adopting and utilising sustainable methods of transport.

BICYCLE PARKING

- **20 bicycle spaces** are provided inside the development adjacent to the underground entry.
- Nearby end of trip facilities, including **showers, changerooms and lockers** are provided for cyclists.
- A **bike repair station** will be provided in the bicycle storage space.

CAR PARKING

- A project specific Traffic Report has been developed under separate cover, whereby the following allocation of a total of **67 parking spaces** (63 + 4 Accessible) will be provided. Note – 3 car parks will be used as drop off zone.
- **6 dedicated motorbike parking** spots will be provided.

ELECTRIC VEHICLE INFRASTRUCTURE

- At least **2x Electric Vehicle (EV) charging points** will be provided.
- **Electrical infrastructure** will be installed to allow for the provision of EV charging points throughout the car parking area in the future.

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

- **Clearly labelled recycling bins** will be provided in refuse room.
- **Separated waste streams** will be built into kitchen joinery, making it easy for students and staff to divert as much waste from landfill as possible.
- On-site **organic waste systems** will be provided.

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.

COMMUNAL SPACES

- **The majority of the facility is communal space** including the swimming pools, gym, fitness, multipurpose room, indoor courts as well as communal break out areas on Level 2 West and a communal foyer.

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SITE VEGETATION

- The project will incorporate landscaping into the surrounds including **landscaped terraces**, helping reduce the urban heat island effect and provide amenity for students, staff and visitors. Roughly 23% of the project site will be vegetated.

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 development seeks to address and manage the selection and specification of sustainable building materials.

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.
- 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**, such as recycled feature brick walls and the reuse of existing brickwork, will be pursued through detailed design.

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**.

5.10 Innovations

- **100% Renewable** - The building will install a minimum of 200kW of Solar PV and will source any other electricity needs from Certified GreenPower sources as part of PLC's commitment to use 100% renewable energy.
- **Thermal imaging** will be used on a sample of spaces to verify the thermal construction and build quality of the building envelope to ensure that has been constructed as per its designed intent. Note: currently there are no benchmarks for evaluation of the quality of thermal constructions of a building.
- **Air permeability testing** – the development aims to achieves best practice building air permeability rates at 50Pa. Testing area will focus on the Aquatic centre.
- **Education** for students and visitors on the sustainability aspects incorporated into the design will be on display within the sports and aquatic centre.

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Appendix A - Implementation Plan

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SMP Item	Initiative / Action	Responsibility	Date Completed
Commissioning	Commissioning shall generally be in accordance with CIBSE Commissioning Codes or ASHRAE Commissioning Guideline 1-1996 (for mechanical services only) and CIBSE Commissioning Codes for other services	Building Services Engineers Services Contractors	
Building Users Guide	Produce a digital building users guide with details on how to optimise operation of building systems to further reduce energy and water consumption	Architect Services Consultant Services Contractors	
Metering and Monitoring	Ensure all meters are installed as per drawings and that BMS systems are set up effectively	Services Contractors Head Contractor	
Waste Management Plan	Contractor shall implement a Waste Management Plan (WMP)	Head Contractor	
Volatile Organic Compound (VOC)	Internal paints, adhesives, sealers, flooring, wall and ceiling coverings and mattresses are to be selected for their low VOC properties	ESD Consultant Architect Head Contractor	
Building Fabric	Ensure insulation is installed as per insulation mark-up, ensure thermal bridging is minimised and air tightness maximised	ESD Consultant Head Contractor	
Energy efficient lighting	LED lighting, compact fluorescent or other energy efficient lighting shall be nominated for the development	Electrical Engineer Architect Head Contractor	
Heating cooling system	HVAC equipment will be designed to be more energy efficient than standard practice	Mechanical Engineer Head Contractor	
Lighting power density	Achieves a lighting power density at least 10% lower than those required BCA 2019 Section J requirements and will meet the maximum lighting power density allowable in Table J6.2a (NCC 2019)	Electrical Engineer Head Contractor	
Motion / time switch controls	Limited access area lighting (including carpark lighting) and outdoor lighting to be controlled by motion sensors or timers as appropriate	Electrical Engineer Head Contractor	



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Domestic Hot Water	Ensure that domestic hot water system is high efficiency air to water heat pumps or supplemented by high efficiency gas boilers	Hydraulic Engineer Head Contractor	
Hot water pipes	All hot water piping above 25mm diameter shall be insulated with pre formed sectional glasswool or polyester insulation, having a maximum k factor of 0.036 W/m ² K at 20°C mean temperature. All external pipework insulation must be sheathed with 0.5mm thick zinc anneal sheet metal. All sheathing is to be installed in a manner which resists entry of water and UV light.	Hydraulic Engineer Head Contractor	
Water efficiency	<p>Minimum requirement as follows:</p> <ul style="list-style-type: none"> • Flow restricting devices on all fixtures • 3 Star WELS (>6 but <=7.5 L/min) showerheads • 6 Star WELS taps • 4 Star WELS WCs (6/3L flush) • 5 Star dishwashers • 5 Star dishwashers 	ESD Consultant Architect Head Contractor	
Sustainable materials	<ul style="list-style-type: none"> • Reinforcing steel used for the project shall be produced using energy-reducing processes and assembled using off site optimal fabrication techniques • All PVC products shall be "Best Practice PVC" or equivalent • All timbers are recommended to be FSC certified • All engineered wood products shall have low or no formaldehyde. 	ESD Consultant Architect Head Contractor	
Stormwater management	Water Sensitive Urban Design (WSUD) assessment shall be conducted for the proposed development	Civil Engineer	
Landscaping	<p>Ensure all plant species are drought tolerant.</p> <p>Ensure irrigation systems are subsoil drip systems and that the irrigation is connected to the rainwater tank as a primary source.</p>	Hydraulics Engineer Landscape Architect Head Contractor	
C&D Waste Management	Ensure that at least 80% of construction & demolition waste is diverted from landfill	Head Contractor	
Operational Waste Management	Ensure separated waste streams are built into kitchen joinery, including recycling, general waste and organics.	Architect Head Contractor	



Appendix B - BESS Assessment

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BESS Report

Built Environment Sustainability Scorecard

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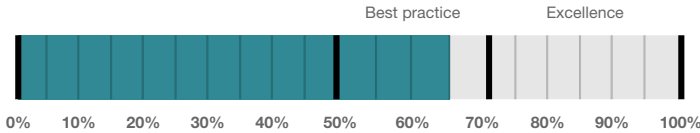


This BESS report outlines the sustainable design commitments of the proposed development at 141 Burwood Hwy Burwood VIC 3125. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at White City.

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.

Note: This is a DRAFT and not suitable for submission to council

Your BESS Score



64%

Project details

Address 141 Burwood Hwy Burwood VIC 3125
 Project no C8A6C3DA
 BESS Version BESS-6

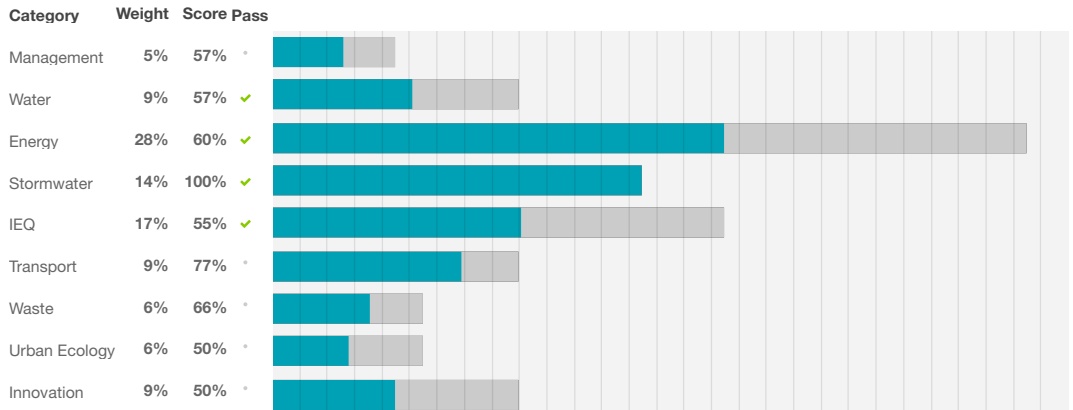
Site type Non-residential development
 Account marelle.davey@wge.com.au
 Application no.
 Site area 13,700 m²
 Building floor area 13,027.0 m²
 Date 14 October 2021
 Software version 1.7.0-B.371



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Performance by category

● Your development ● Maximum available



Buildings

Name	Height	Footprint	% of total footprint
Building 1	3	8,250 m ²	100%

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Dwellings & Non Res Spaces

Non-Res Spaces

Name	Quantity	Area	Building	% of total area
Public building				
Sports and Aquatic Centre	1	13,027 m ²	Building 1	100%
Total	1	13,027 m²	100%	

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Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Floor plans showing location of photovoltaic panels as described.		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
Transport 1.4	All nominated non-residential bicycle parking spaces		-
Transport 1.6	Showers, change rooms and lockers as nominated		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Transport 2.3	All nominated motorbicycle parking spaces		-
Waste 2.1	Location of food and garden waste facilities		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Size and location of communal spaces		-
Urban Ecology 2.1	Vegetated areas		-

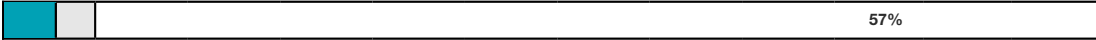
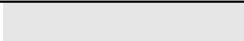




Supporting evidence

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 3.1	Provide a written explanation of either the fully natural carpark ventilation or carbon monoxide monitoring, describing how these systems will work, what systems are required for them to be fully integrated and who will be responsible for their implementation throughout the design, procurement and operational phases of the building life.		-
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.		-





Credit	Requirement	Response	Status
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.		-

Credit summary

Management Overall contribution 4.5%

		57%
1.1 Pre-Application Meeting		0%
2.3 Thermal Performance Modelling - Non-Residential		100%
3.2 Metering		N/A ✦ Scoped Out
		No commercial tenancies.
3.3 Metering		100%
4.1 Building Users Guide		100%

Water Overall contribution 9.0%

		Minimum required 50%	57%	✔ Pass
1.1 Potable water use reduction		40%		
3.1 Water Efficient Landscaping		100%		
4.1 Building Systems Water Use Reduction		100%		

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Energy Overall contribution 27.5%

		Minimum required 50%	60%	✓ Pass
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 supply in use.		
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	⊘ Disabled
		No other (non-solar PV) renewable energy is in use.		

Stormwater Overall contribution 13.5%

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

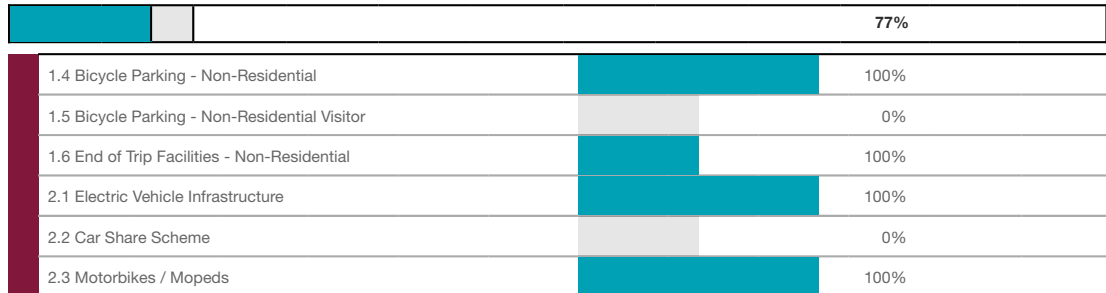
IEQ Overall contribution 16.5%

		Minimum required 50%	55%	✓ Pass
1.4 Daylight Access - Non-Residential			33%	✓ Achieved
2.3 Ventilation - Non-Residential			66%	✓ Achieved
3.4 Thermal comfort - Shading - Non-residential			83%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
4.1 Air Quality - Non-Residential			100%	

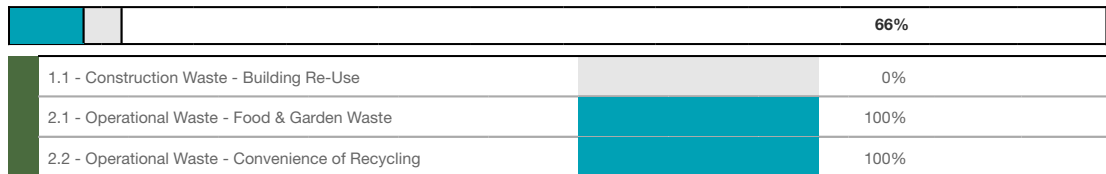
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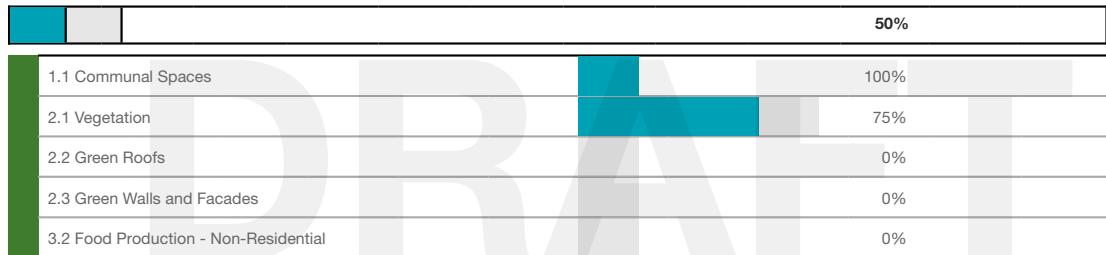
Transport Overall contribution 9.0%



Waste Overall contribution 5.5%



Urban Ecology Overall contribution 5.5%



Innovation Overall contribution 9.0%




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Credit breakdown

Management Overall contribution 3%

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		100%
Score Contribution	This credit contributes 28.6% towards the category score.	
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?	
Question	Criteria Achieved ?	
Public building	Yes	
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?	
Question	Criteria Achieved ?	
Public building	Yes	
3.2 Metering		N/A  Scoped Out
This credit was scoped out	No commercial tenancies.	
3.3 Metering		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Have 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 5% 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?:	Yes
Are you installing a rainwater tank?:	Yes
Water fixtures, fittings and connections	
Building:	Building 1
Showerhead:	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	Scope out
Kitchen Taps:	>= 6 Star WELS rating
Bathroom Taps:	>= 6 Star WELS rating
Dishwashers:	>= 5 Star WELS rating
WC:	>= 4 Star WELS rating
Urinals:	Scope out
Washing Machine Water Efficiency:	>= 5 Star WELS rating
Rainwater Tank	
What is the total roof area connected to the rainwater tank?: Tank 1	8,214 m ²
Tank Size: Tank 1	350,000 Litres
Irrigation area connected to tank: Tank 1	3,265 m ²
Is connected irrigation area a water efficient garden?: Tank 1	No
Other external water demand connected to tank?: Tank 1	13,002 Litres/Day

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1.1 Potable water use reduction		40%
Score Contribution	This credit contributes 71.4% 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	64940 kL	
Output	Proposed (excluding rainwater and recycled water use)	
Project	45853 kL	
Output	Proposed (including rainwater and recycled water use)	
Project	39322 kL	
Output	% Reduction in Potable Water Consumption	
Project	39 %	
Output	% of connected demand met by rainwater	
Project	39 %	
Output	How often does the tank overflow?	
Project	Never / Rarely	
Output	Opportunity for additional rainwater connection	
Project	9115 kL	
3.1 Water Efficient Landscaping		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Will water efficient landscaping be installed?	
Question	Criteria Achieved ?	
Project	Yes	
4.1 Building Systems Water Use Reduction		100%
Score Contribution	This credit contributes 14.3% towards the category score.	
Criteria	Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?	
Question	Criteria Achieved ?	
Project	Yes	

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Energy Overall contribution 16% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	No
Non-Residential Building Energy Profile	
Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	3,426,900 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	3,313,400 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	3,313,400 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:	597,542 kWh
Hot Water - Electricity - Proposed:	410,915 kWh
Lighting - Baseline:	267 kWh
Lighting - Proposed:	240 kWh
Peak Thermal Cooling Load - Baseline:	900 kW
Peak Thermal Cooling Load - Proposed:	810 kW
Solar Photovoltaic system	
System Size (lesser of inverter and panel capacity): Solar PV	200 kW peak
Orientation (which way is the system facing)?: Solar PV	North
Inclination (angle from horizontal): Solar PV	5.0 Angle (degrees)
1.1 Thermal Performance Rating - Non-Residential	12%
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 (NCC 2019 Section J)?
Output	Total Improvement
Public building	3 %
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?
Output	Reference Building with Reference Services (BCA only)
Public building	4,104,931 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Public building	3,798,801 kg CO2
Output	% Reduction in GHG Emissions
Public building	7 %

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2.2 Peak Demand		100%
Score Contribution	This credit contributes 5.0% towards the category score.	
Criteria	What is the % reduction in instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Public building	900 kW	
Output	Peak Thermal Cooling Load - Proposed	
Public building	810 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Public building	10 %	
2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 10.0% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Public building	4,024,442 kWh	
Output	Proposed	
Public building	3,724,315 kWh	
Output	Improvement	
Public building	7 %	
2.4 Gas Consumption		N/A  Scoped Out
This credit was scoped out	No gas supply in use.	
3.1 Carpark Ventilation		100%
Score Contribution	This credit contributes 10.0% 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?	
Output	Reference	
Public building	597,542 kWh	
Output	Proposed	
Public building	410,915 kWh	
Output	Improvement	
Public building	31 %	

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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 J6.2a of the NCC 2019 Vol 1?	
Question	Criteria Achieved ?	
Public building	Yes	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A ✦ Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.	
4.2 Renewable Energy Systems - Solar		100%
Score Contribution	This credit contributes 5.0% 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	233,246 kWh	
Output	% of Building's Energy	
Public building	6 %	
4.4 Renewable Energy Systems - Other		N/A ⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.	

Stormwater Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:		MUSIC or other modelling software
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	Flow (ML/year)	
Project	90.0 % Reduction	
Question	Total Suspended Solids (kg/year)	
Project	80.0 % Reduction	
Question	Total Phosphorus (kg/year)	
Project	45.0 % Reduction	
Question	Total Nitrogen (kg/year)	
Project	45.0 % Reduction	

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IEQ Overall contribution 9% Minimum required 50%

1.4 Daylight Access - Non-Residential		33%	✓ Achieved
Score Contribution	This credit contributes 35.3% towards the category score.		
Criteria	What % of the regular use floor areas have at least 2% daylight factor?		
Annotation	Preliminary modelling has been completed for regularly occupied spaces.		
Question	Percentage Achieved?		
Public building	33 %		
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	25 %		
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		83%	
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	75 %		
3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	What percentage of regular use areas in tenancies have ceiling fans?		
Question	Percentage Achieved?		
Public building	0 %		
4.1 Air Quality - Non-Residential		100%	
Score Contribution	This credit contributes 5.9% towards the category score.		
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?		
Question	Criteria Achieved ?		
Project	Yes		

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

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Transport Overall contribution 7%

1.4 Bicycle Parking - Non-Residential		100%
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	Yes	
Question	Bicycle Spaces Provided ?	
Public building	20	
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	0	
1.6 End of Trip Facilities - Non-Residential		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Where adequate bicycle parking has been provided. Is there also: * 1 shower for the first 5 employee bicycle spaces plus 1 to each 10 employee bicycles spaces thereafter, * changing facilities adjacent to showers, and * one secure locker per employee bicycle space in the vicinity of the changing / shower facilities?	
Question	Number of showers provided ?	
Public building	33	
Question	Number of lockers provided ?	
Public building	94	
Output	Min Showers Required	
Public building	1	
Output	Min Lockers Required	
Public building	20	
2.1 Electric Vehicle Infrastructure		100%
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	Yes	

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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		100%
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	Yes	

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 3%

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 : * 1m ² for each of the first 50 occupants * Additional 0.5m ² for each occupant between 51 and 250 * Additional 0.25m ² for each occupant above 251?	
Question	Common space provided	
Public building	6,509 m ²	
Output	Minimum Common Space Required	
Public building	463 m ²	
2.1 Vegetation		75%
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	23 %	
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 m ²	
Output	Min Food Production Area	
Public building	326 m ²	

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Innovation Overall contribution 4%

Innovations	
Description:	
100% Renewable	The building will utilise onsite solar PV generation and offsite electricity sourced from Certified Green Power sources as part of PLC's commitment to use 100% renewable energy
Pressure Testing	During construction, the project will utilise blower door pressure testing for the Aquatic Centre in order to ensure the building is sealed to high standards. This will significantly improve the overall energy performance of the building and allow for the mechanical systems to operate as intended.
Thermal Imaging	Thermal imaging will be used on a sample of spaces to verify the thermal construction and build quality of the building envelope to ensure that has been constructed as per its designed intent. Note: currently there are no benchmarks for evaluation of the quality of thermal constructions of a building.
Education	Education for students and visitors on the sustainability aspects incorporated into the design will be on display within the sports and aquatic centre.
Points Targeted:	
100% Renewable	2
Pressure Testing	1
Thermal Imaging	1
Education	1
1.1 Innovation	50%
Score Contribution	This credit contributes 100.0% towards the category score.
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?

Note
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Appendix C - 100% Renewable Model

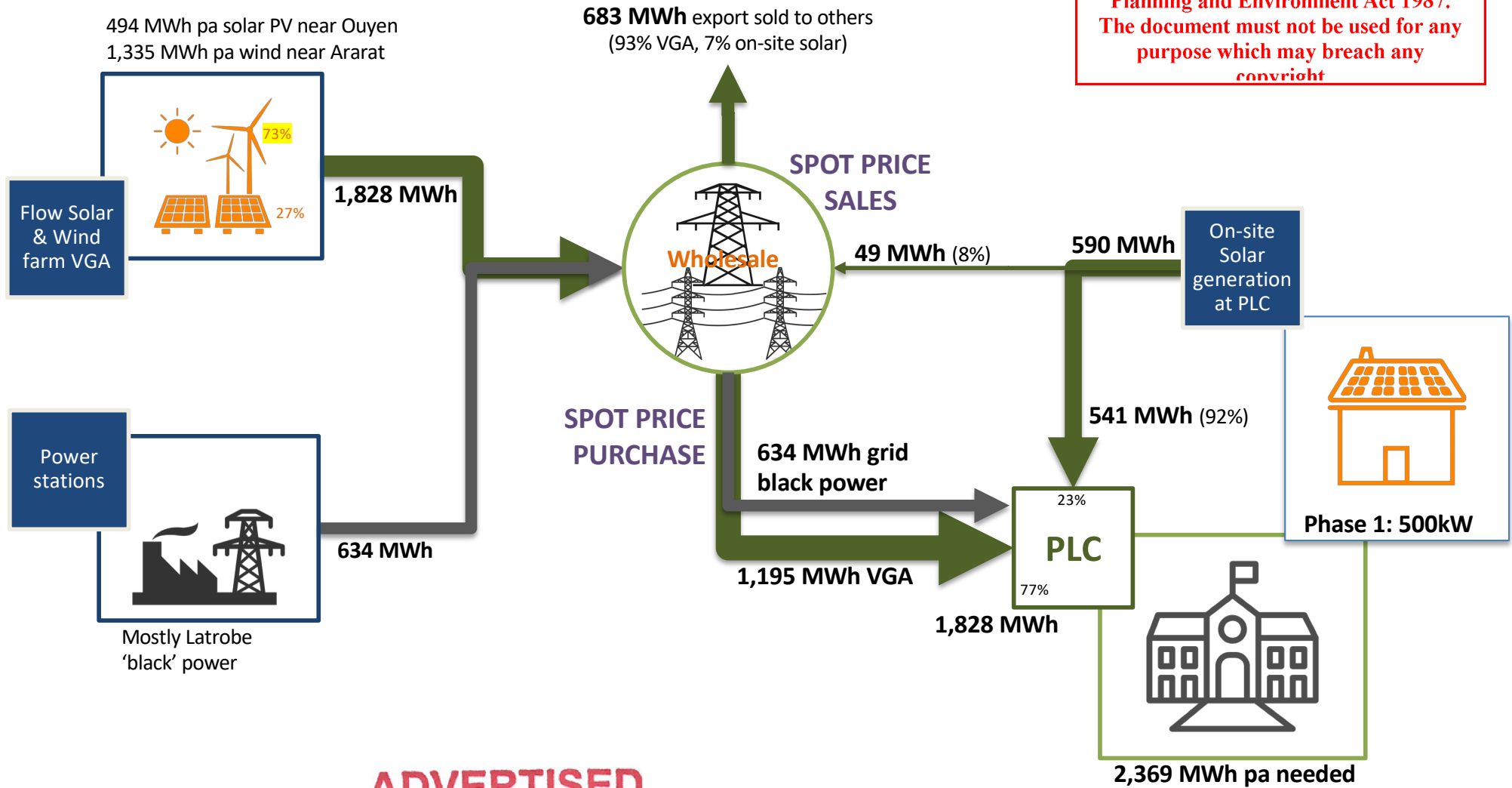
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Operating model

How energy is generated and sold to the school

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community in mind

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570 Bourke Street
Melbourne VIC 3000
Tel +61 +61 3 8554 7000

For more information please visit
www.stantec.com

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