

25 The Esplanade, Mount Pleasant

Ecological Sustainable Design Report

San Brolo Pty Ltd

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Executive Summary

This report outlines the Ecological Sustainable Design (ESD) strategy for the proposed development at 25 The Esplanade, Mount Pleasant, WA. The new building will comprise 12 single-key and dual-key apartments and a parking garage in the basement and on the ground floor.

The development is located in the Ogilvie Quarter which is part of the Canning Bridge Activity Centre Plan (CBACP). A key part of this plan is the integration of sustainable strategies and design into master planning and all new buildings. Table 1 below confirms that the proposed 25 The Esplanade, Mount Pleasant development will respond to these requirements and outlines which sections of this report are relevant for each requirement.

Table 1 – CBACP Requirements

	CBACP Requirement	Requirement fulfilled?	Section in this Report for further Detail / Comments
11.1	All non-residential development shall provide end of trip facilities comprising one change room per storey [...]. Change rooms shall comprise lockers, towel drying racks and be located to enable privacy.	N/A	The proposed development is solely residential, this criterion therefore does not apply.
11.2	All non-residential development shall provide end of trip facilities comprising one shower for every ten cycle bays required [...], with a minimum provision of one shower facility in any one non-residential development.	N/A	
11.3	Where bicycle parking is provided [...], a locker must be provided for every bicycle parking bay provided [...].	N/A	
11.4	All non-residential development shall provide bays for the exclusive use of charging electric cars at a rate of one bay in every 25 bays required [...]. Electric car bays shall be located near to stairwells or elevators [...].	N/A	The proposed development is solely residential, this criterion therefore does not apply. However, two electric charging bays will be provided for the residents of the building. (Also refer to Section 3.4.4)
11.5	All new development shall be designed to maximise passive solar principles for heating, cooling, ventilation and energy conservation.	✓	Solar passive principles including a north south-orientation have been applied. (Refer to Section 2.1)
	East and west facing glazing shall be minimised and shading devices shall be employed [...]	✓	The building aims reach a 25% reduction of energy use compared to the minimum energy usage requirements. (Also refer to Section 2.1.7)
	All buildings shall be designed to enable access to natural light and cross ventilation .	✓	The north-south orientation paired with the floor plan design allows for maximum daylight access and good cross ventilation. (Also refer to Sections 2.1.2 and 3.1)
	At a minimum, all new development within the [...] Davilak Quarters [...] shall achieve a 4-star Green star design rating [...].	✓	The development will target a 4-star Green Star Equivalency as outlined in this report.

Additionally, the building design is aiming to exceed the above requirements. A minimum 6 star and an average 7.0 Star NatHERS rating is targeted for this development.

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1.0 Introduction

This report outlines the key Ecological Sustainable Design (ESD) initiatives for the proposed multi-residential development located at 25 The Esplanade, Mount Pleasant, WA.

The development will be located within the boundary of the City of Melville, positioned along the Swan River. The Canning Bridge Station is within a 1000 m walking distance.

The development is set within the Ogilvie Quarter which is part of the Canning Bridge Activity Centre Plan (CBACP) defining the parameters for the future development in this area. A key part of this plan is the integration of sustainable strategies and design into master planning and all new buildings.

The proposed building will comprise 12 apartments. A large communal area on the roof of the building will invite residents to socialise, exercise and meditate.

The required parking will be provided on the basement level as well as on the ground floor. All apartments offer large balconies with wide eaves for shading. Vegetation in planters along the façade and on the roof will help to regulate the building's microclimate, provide visual comfort and increase the occupant's connection to the natural environment.

The development includes several sustainability initiatives which are addressed in detail in the report.



Figure 1 – Location and context of the development site

1.1 The Canning Bridge Activity Centre Plan

The Ogilvie Quarter is recognised as an Activity Centre under the Western Australian Planning Commission’s (WAPC) *State Planning Policy 4.2: Activity Centres for Perth and Peel*. Based on this, the City of South Perth and the City of Melville developed the Canning Bridge Activity Centre Plan (CBACP) together with the WAPC and other governmental bodies in 2015 to ensure that “the Canning Bridge area will evolve to become a unique, vibrant, creative community [...]” [1].



Figure 2 – Canning Bridge Activity Centre Plan

Section 11 of the Deign Guideline of the CBACP defines which sustainability strategies should be applied to every new development. Table 1 in the Executive Summary of this report summarises the required measures and how the proposed development responds to these obligations.

1.2 Sustainability Targets

Due to the relatively small size of the development, a 4-star Green Star equivalency rating under the Design & As-Built v1.3 is proposed for the development. Although not pursuing a certified Green Star rating, the development should demonstrate that it would meet a 4-star Green Star equivalent standard with the sustainable design initiatives implemented in the project. The overarching sustainability targets therefore read as follows:

- 4-Star Green Star Design & As Built equivalent standard;
- Minimum 5.5-star and average 7-star NatHERS rating.

The project is also required to comply with the National Construction Code (NCC) Section J for Energy Efficiency. These commitments are outlined in more detail in the following sections.

This report has been developed in three key sections as noted below. Each section will focus on a key concern for the development and provide an insight as to how these items will be addressed throughout the design process.

- **Resource Consumption** – this section of the report provides information into the methodologies to be investigated to ensure that energy, water and materials consumption is minimised throughout construction, operation and demolition.
- **Creating Spaces for People** – this section of the report outlines how the internal and external spaces will be optimised for occupant health, wellbeing and comfort.
- **Codes and Ratings** – describing how the building will comply with relevant voluntary and mandatory codes and rating schemes.

2.0 Resource Consumption

Buildings consume considerable natural resources in their construction, operation and demolition. This section of the report will provide details about the potential impacts caused by the building and how these impacts have been reduced when compared to typical buildings of this nature. The building will aim to reduce the total embodied energy and carbon considered in the construction and then aim to maximise the operational efficiency of the building’s services to provide and enhance tenant provisions for the minimum amount of energy and water. Furthermore, methods for maintaining operational efficiency will be investigated to ensure that the benefits are maximised over the life of the building.

2.1 Energy Reduction Strategies

The construction industry is responsible for around 20% of Australia’s carbon footprint. These emissions include embodied energy and water consumption that goes into the building during construction as well as operational energy and water usage of the completed building, maintenance during the life span and the demolition at the end of the building’s life. This section sets out possible strategies to reduce the buildings energy demand and greenhouse gas emissions.

2.1.1 Natural Ventilation

All living rooms and bedrooms of the apartments are designed have operable glazing elements. These façade elements promote natural ventilation and allow for purging warm air at night.

When closed during the day, cool air can be stored within the apartment to reduce or eliminate the need for air conditioning. The generous openings to all living spaces also enable occupants to make use of the favourable outdoor conditions which prevail in Perth for 20% of the time, again reducing the need for mechanical heating or cooling during these times.

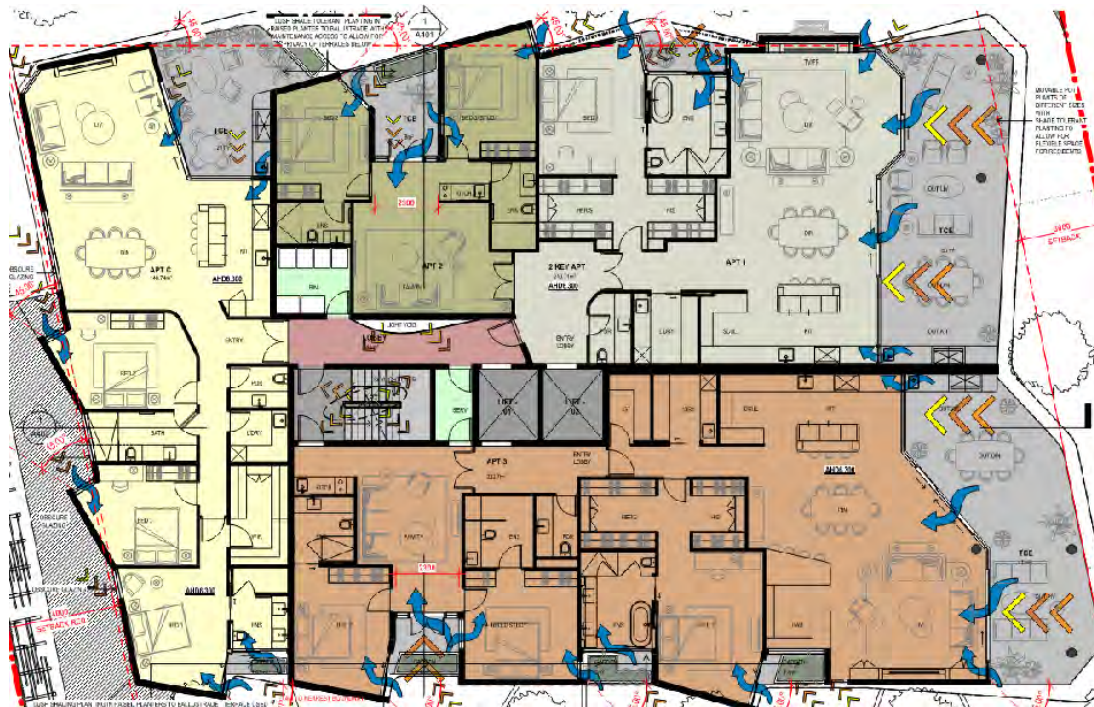
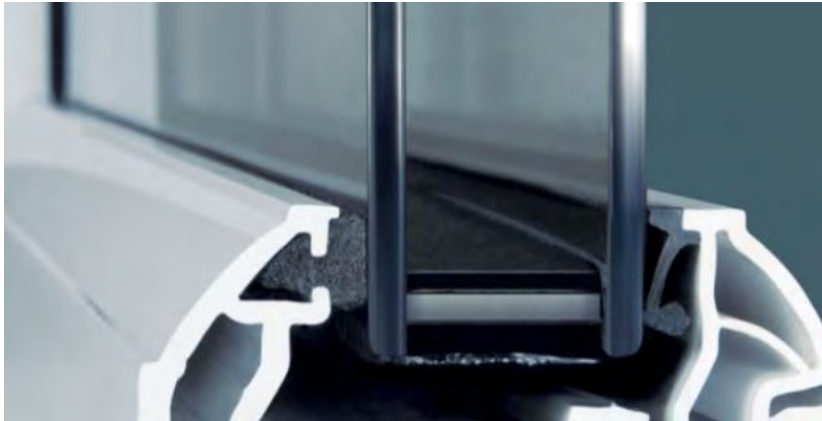


Figure 3 – Wind patterns and cross ventilation

2.1.2 Double glazing



The proposed high-performance glazing to all facades provides solar control to prevent summer heating while allowing useful passive solar heating in winter.

Double-glazed windows and glazed doors with low U-Value will minimize the conductive heat loss and gain.

This results in an improved energy rating of apartments as well as a reduced overall carbon footprint of the development.

2.1.3 Awnings and shade screens

Glazed openings are provided generally on all orientations, however the east and northern facade are provided with screens or awnings. The screens to living spaces and bedroom windows are carefully designed to provide sufficient levels of shading along the northern and western facades, while still allowing for enough transparency to enjoy views and maximise daylight access. The shading on the western and northern façade will help to reduce heat gains inside the apartments during the hot summer months minimising the need for air conditioning further.

All balconies are designed with generous awnings to assist with shading and reduced energy consumption of the building. They also increase the usability and comfort of the balcony spaces to promoting ‘outdoor living’.

Refer to Architectural elevations and floor plans.

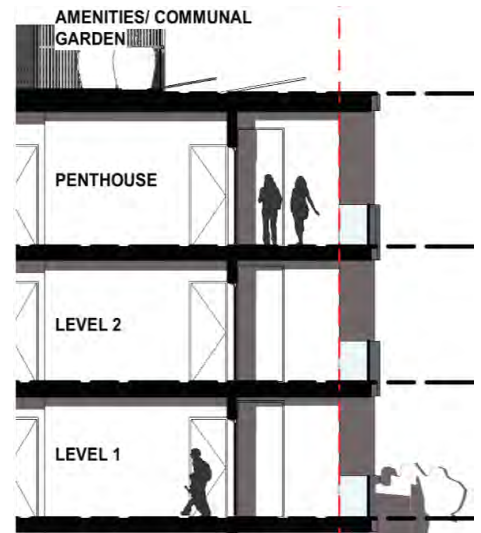


Figure 4 – Shading to eastern balconies

2.1.4 Photovoltaic Panels

Solar Photovoltaic (PV) panels installed to the roof of the building supplying power for the of the public areas, including corridors, stairwells and garage. Currently 80 PV panels are proposed. This will equate to to approximately 25kW of PV array for the building. Refer to the Architectural roof plan and electrical drawings.

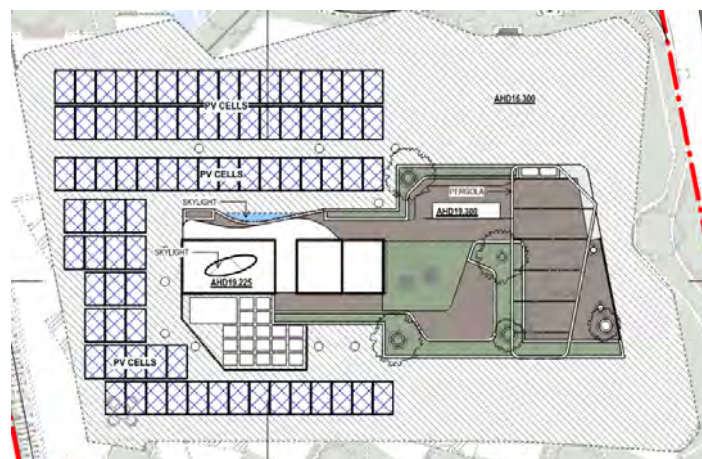


Figure 5 – Extract Architectural roof plan showing Solar PV

2.1.5 Embedded Network

The project team explores the implementation of an embedded network strategy. For this strategy, an independent provider purchases bulk energy from the retail energy market, blends it with the power generated by the solar panels on the building, and delivers it to each apartment via an ‘Embedded Network’.

Using a gate meter at the front of the apartment building, this private energy network distributes the energy purchased by the provider, on-selling it to individual tenants. Each individual apartment has its own sub-meter incorporating smart meter technology that allows residents to track how much power they are using and how much it costs.

- Sustainable solution to make solar energy accessible to all residents (not only to the communal areas)
- Lower electricity prices for residents supports affordable housing costs
- Reduced strata fees for owners and owner-occupiers
- Raised awareness of individual energy consumption through transparent smart metering

Figure 6 below illustrates the principle of an embedded network strategy.

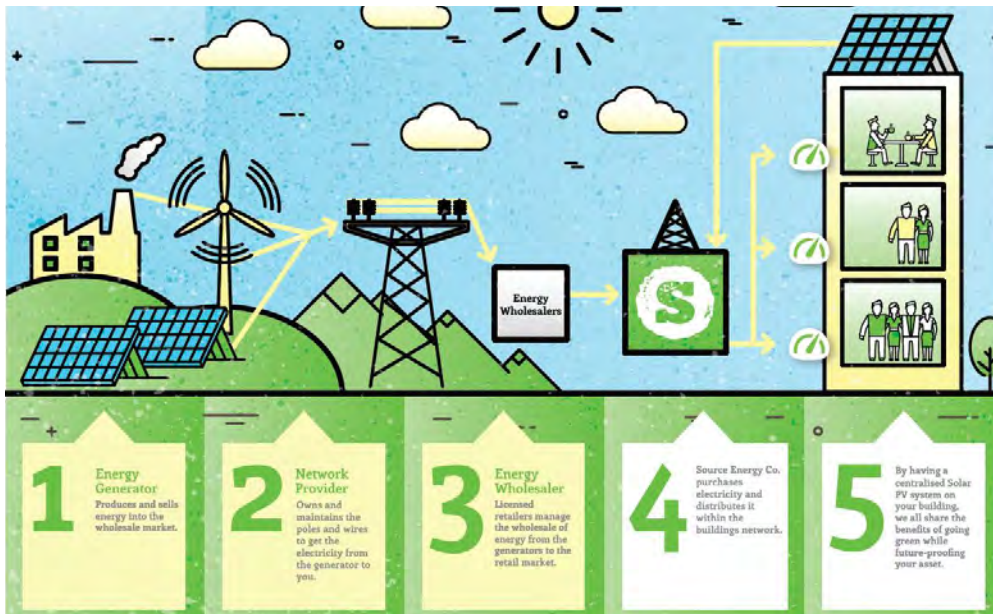


Figure 6 – Embedded Energy Network Principles (Source Energy Co.)

2.1.6 Light fittings

All light fitting will be energy saving LED fittings including lighting in the ‘communal’ corridors, stairwells, garage and external lighting. All common area lighting will also incorporate light sensing such as occupancy sensing (PIRs) to reduce energy consumption when lighting is not required.

Additionally, all downward facing fittings will be installed only for the external landscaped areas to reduce the negative effects of light pollution.

2.1.7 Increased NatHERS

As per the BCA minimum compliance, a minimum rating of 5-Star NatHERS and an average of 6 Star NatHERS for all apartments under the Nationwide House Energy Rating Scheme (NatHERS) is required for the development.

All mainly passive measures listed above to reduce energy consumption will contribute to exceeding these minimum requirements. An overall average rating of 7 stars will be achieved which means a reduction of the average energy consumption by 25% compared to the required 6 Star rating. Table 2 below summarises these NatHERS rating targets.

Refer to the NatHERS report for the project.

Table 2 – NatHERS Comparison

	NCC Requirement	Proposed Development Target
Minimum NatHERS Rating	5 Stars	5.5 Stars
Average NatHERS	6 Stars	7 Stars
Average Energy Use	70MJ/m ²	53MJ/m ²

2.2 Potable Water Strategies

The water consumption of Western Australian households is the second highest in Australia with an average of 241,000 litres, well above the Australian average of 190,000 litres [2]. A reduction of water usage does not only alleviate pressure from the local water supply but also means reduced costs of living for households in WA.

The following measures to reduce water consumption are planned to be included in the proposed development.

2.2.1 Sanitary Fittings

Occupant consumption is a major contributor to potable water usage. The following water fixture WELS ratings will be installed to ensure the efficient use of potable water by building occupants:

Table 3 – Sanitary fitting requirements

Fixture / Equipment Type	WELS Rating
Taps	6 Star
Toilets	4 Star
Showers	3 Star
Clothes Washing Machine	5 Star
Dishwashers	6 Star

2.2.2 Irrigation

A major amount of potable water usage goes back to landscape irrigation. To reduce the amount of water used for the landscaped areas on the ground floor on the planters along the façade and for the roof terrace, a drip system with moisture sensor control will be installed for irrigation.



2.2.3 Fire Systems

No sprinklers are planned to be installed in this development which means that the fire testing system does not expel potable water for testing. Refer to the Hydraulic documentation for the project.

2.3 Transparent Consumption

2.3.1 Water Metering and Leak Detection

A system that both monitors and manages water consumption is planned to be installed. Water metering will be provided to all major water uses within the building with connections to the BMS ensuring immediate and effective monitoring of water consumption and leakages for simple rectification.

Refer to Hydraulic documentation for the project.

2.3.2 Smart Metering

Provision of smart metering for the energy and water usage recording, tracking with user interface would be a novel feature on this development. This might be a web-based system that residents can log in to view their own apartment's energy consumption. The software could also provide a snap shot view of how the building is performing and highlight apartments which are faring better than others for benchmarking. This provides a means to inform the residents as well as engage them in a sustainable lifestyle. The smart metering could also be part of an Embedded Network Strategy.



2.4 Building Materials and Resource Minimisation

In 2014-15 Australia produced the equivalent of 565kg per capita of municipal waste and 831kg of construction and demolition waste. While around 60% of this waste is recycled, a large part still goes to landfill [3]. A reduction of both construction and operational waste is therefore an important target of the proposed development.



The design team is aiming to reduce the carbon footprint during construction and an in form of embodied energy within building materials. At least 60% of the steel used for reinforcing bar and mesh that will be used has been produced using energy-reducing manufacturing methods. All timber used for construction works will be either certified as responsibly sourced or recycled material.

A dedicated waste storage area will be provided for the separation and storage of recyclable waste during operation, allowing for the different waste streams to be separated to match the local recycling scheme. In addition, a closed loop organic unit will be placed on the waste room to divert organic waste from landfill.

Throughout project design, operation and construction, principles of resource recovery will be applied, so that materials and products are recovered and reused where possible, reducing landfill and saving money.

2.5 Embodied Carbon

While building operations such as the use of electricity or water generate greenhouse gases, carbon and carbon equivalent gases are also emitted through the production and delivery of products and materials for construction.

For example, to produce Portland cement, a main ingredient in concrete, raw materials are crushed and then heated to over 1400 degrees Celsius. This requires a significant amount of energy and emits large amounts of greenhouse gases during this production process. These gases are accounted as carbon equivalents in form of 'embodied carbon' in a building.

The following measures were considered in the design to reduce the amount of embodied carbon in the proposed development:

Sub-structure	Maximising recycled content of materials in structural components.
Super-Structure	Maximising recycled content in concrete and formwork. Use of lightweight and reusable materials where possible
Envelope	Adopting a low-carbon, lightweight approach; Considering the necessity of massing elements; Considering composite materials or dual function elements. Considering the use of recycled materials
Internal Walls	Considering the necessity of internal walls; Considering recycled content or reused materials; Considering low carbon steel framing. Designing for flexibility and future proofing to reduce renovation efforts
Internal Finishes	Considering setting a recycled content target for all finishes; Considering long life and highly durable finished is areas of high foot traffic; Considering Carbon Neutral certified products;

3.0 Creating Spaces for People

With the development aiming to build 12 households for residents who spend considerable time within the building, it is essential that the building provides a comfortable and healthy environment for everyone. The development team is investigating several initiatives to enhance the indoor environment through a multitude of different technologies and design features.

The team explored different opportunities to foster a healthy and low-carbon lifestyle outside the building investigating measures to promote walkability, cycling and electric vehicles.

3.1 Daylight and Views

Appropriate day lighting is essential for users' wellbeing, connection to the outdoors and for energy efficiency. However, excessive daylight can cause glare which is a major IEQ concern and should be avoided.

Every living space is designed to have large sliding doors to the balconies in addition to large windows to maximise daylight levels while shading devices are proposed to reduce glare and solar radiation.

The following design opportunities will be considered throughout the detailed design process to maximise the daylighting potential:

- Glass selection: given the extent of proposed glazing, glass with a moderate visual light transmittance (VLT) should allow sufficient daylight to penetrate the space.
- Light internal colours improve daylight penetration.

3.2 Connection to Outdoors

The roof top will provide occupants with an extensive community terrace comprising two entertaining areas and a meditation area for excising, yoga and other activities. This community area will be surrounded by landscaped roof areas including a lawn area and planters with hedges and trees providing a high-quality outdoor area for residents on top of their building.

Large planters are proposed to the western façade framing the views outside with plants and enhancing the connection to the natural environment further. Refer to the Architectural roof drawing.

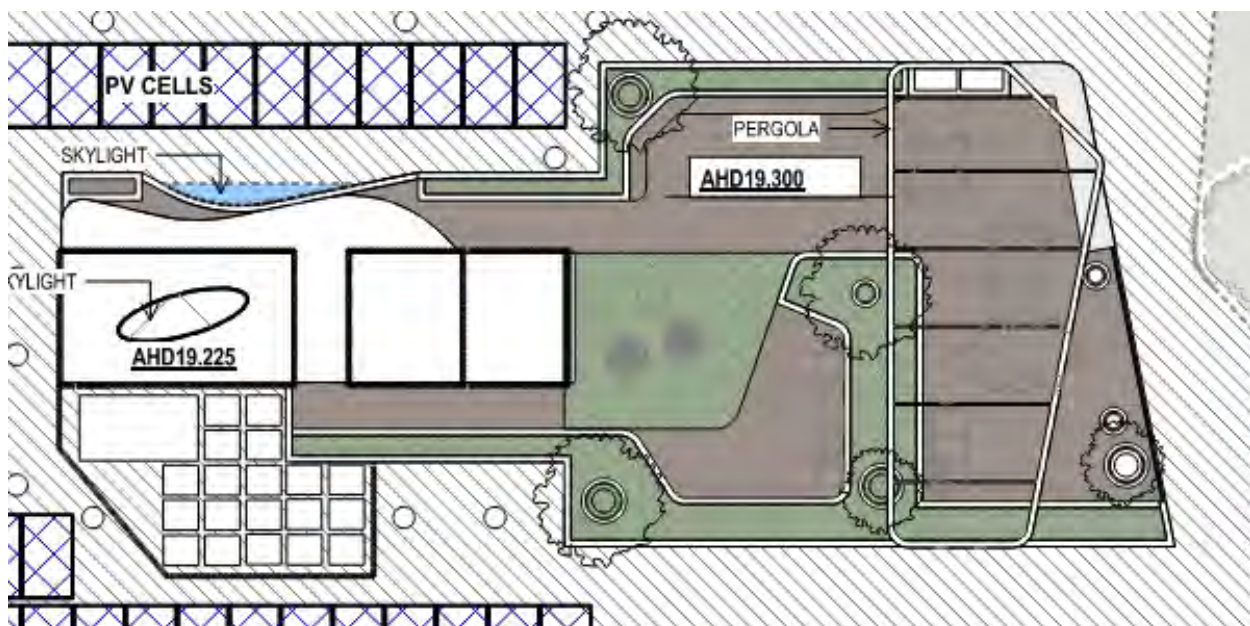


Figure 7 – Proposed community roof area

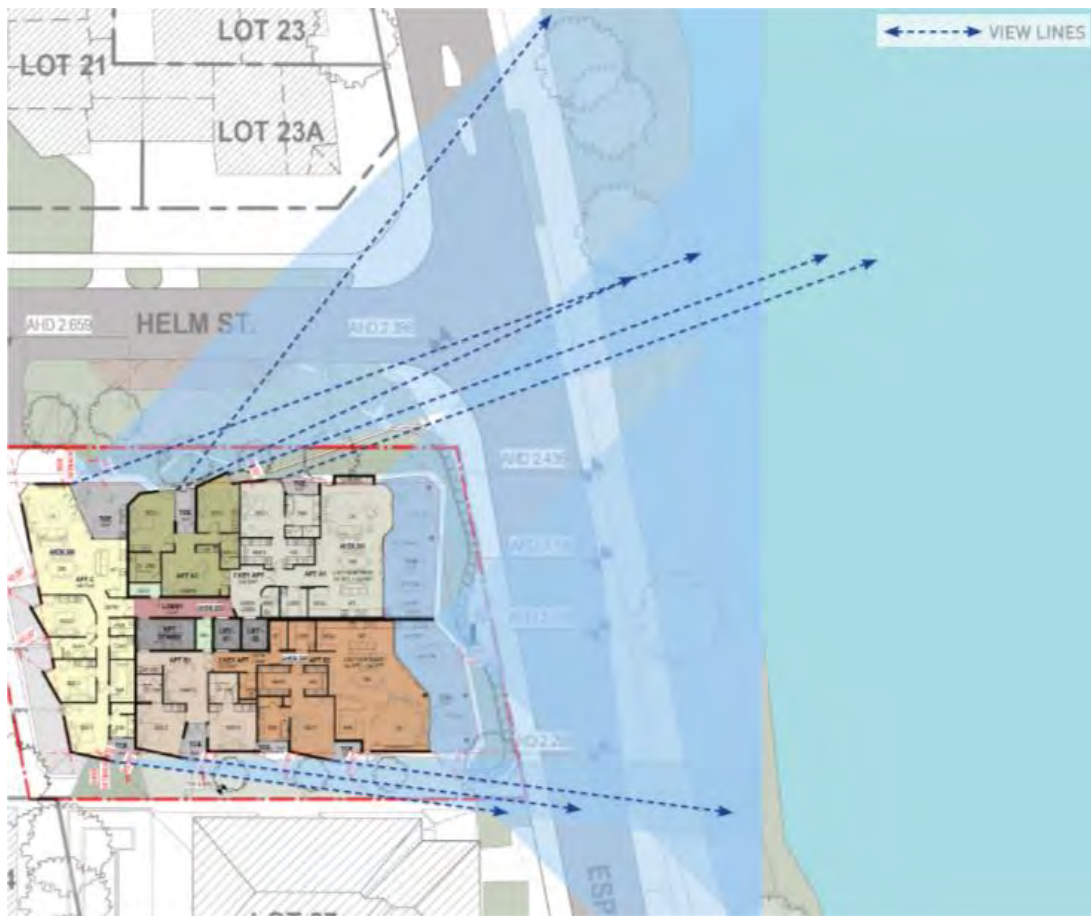


Figure 8 – Views available to all apartments



Figure 9 – View of Swan River

3.3 Indoor Environment Quality

In addition to the building form based indoor environment quality improvements noted above, the following items were implemented in the development.

3.3.1 Emissions & Toxicity

Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short and long term adverse health effects. Concentrations of many VOCs are consistently higher indoors than outdoors. VOCs are emitted by a wide array of products numbering in the thousands (typically paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, office equipment such as copiers and printers).

The development uses paints, adhesives, carpets and engineered woods with a low emissions content including low-VOC and low formaldehyde content to avoid unnecessary contamination of indoor air. 50% of paints used in the project will have maximum TVOC content of 5g/L and are classified as ultra-low.

3.3.2 Thermal comfort

The human body regulates its core temperature via the hypothalamus within a narrow range of 36 to 38 degrees. An indoor environment that is too hot or too cold can affect mood, performance and productivity. However, at which temperature a resident feels comfortable varies significantly from person to person. To control internal comfort and minimise excessive heat loss in winter and heat gains in summer, a number of strategies were implemented for the proposed development:

- Facade design and glass selection is very important; heat gains and losses must be moderated, and thermal bridging should be avoided. Double glazing to the larger sliding doors and high performance glazing for all other windows will be installed to improve the thermal performance of the building envelope. (Refer to the NatHERS report)
- The good performance glazing will additionally help to manage acoustic disturbances from outdoors. Separated parting walls between apartments will also reduce noise impacts from neighbouring flats. The acoustic performance of these walls will be $R_w > 55$, exceeding the required NCC required performance. (Refer to the Acoustic Report)
- The facade will be well sealed to avoid draughts and air leakage which can cause significant heat losses and increase occupant discomfort.

3.4 Sustainable Transport and Active Living

3.4.1 Walkable Neighbourhood

The proposed development is located in the Ogilvie Quarter in Mount Pleasant, west of the Swan River. Being only 300m away from Canning Highway, the development is very close to several local shops and employment opportunities in a convenient walking distance to the proposed development.

3.4.2 Cyclist Facilities

In Perth 48% of all car trips are less than 5km distance. Cars produce an average of 0.3kg of CO₂ per km travelled, whereas, a cyclist emits negligible greenhouse or other pollution. For each kilometre a person cycles instead of driving, approximately 0.3 kg of CO₂ are saved from being emitted to the environment.

Furthermore, cycling will encourage an active and healthy lifestyle for the residents.

The proposed development provides bike parking bays for each apartment and will provide further bike parking opportunities for visitors.

3.4.3 Access to Public Transport

With its location in the Ogilvie Quarter, the proposed development is located in close proximity of the Canning Bridge Transport Hub which acts as a node connecting the north-south railway line from Mandurah to Midland and the east-west bus routes from Fremantle towards Perth Airport.

This transport hub is only 1000 m away from the development and therefore easily accessible by foot or bike. In addition to this major hub, several bus routes are only 300m away from the development, making it very public transport friendly location.



3.4.4 Electric Vehicles

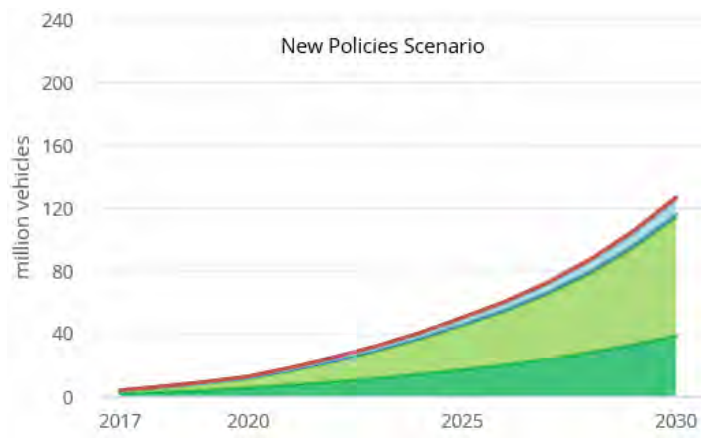


Figure 10 – Global Electric Vehicle Deployment by 2030

The number of electric cars on the road grew to 3 million worldwide between 2016 and 2017. This is an expansion of 56%.

With further expected exponential growth, the number of electric cars on the roads will reach between 125 and 220 million by 2030 according to the International Energy Agency [4].

The proposed development intends to support the uptake of low-emissions and electric vehicles. Two car parking bays will be provided with the infrastructure to charge electric vehicles.

3.5 Local Procurement

The project seeks to support local businesses and committed to have at least 80% of all site workers being located in the Greater Perth Metropolitan Area.

3.6 Occupant Engagement

A post-occupancy survey is planned to be undertaken to identify the levels of individual occupant comfort in the building.

4.0 Codes and Ratings

The building will be subject to voluntary and mandatory building codes and metrics to measure the performance of the rating. This section of the report outlines the main codes and ratings and identifies the projects response.

4.1 NatHERS

Residential building compliance is achieved through a thermal modelling process defined as the Nationwide House Energy Rating Scheme (NatHERS). This process requires a minimum star rating to be achieved for the thermal comfort of the building, which informs the energy efficiency of the building.

The Nationwide House Energy Rating Scheme (NatHERS) is a tool to assess the energy usage of residential dwellings. For a multi-residential development, every apartment is investigated as a separate unit with its own rating before an overall average rating is calculated. The NatHERS tool considers a wide range of parameters like orientation, glazing, insulation, size of rooms and door openings, shading and awnings and ceiling fans.

The National Construction Code (NCC) requires a minimum of a 5-star NatHERS rating for the worst performing apartment in the complex and an overall average NatHERS rating of 6-stars. The proposed development is designed to exceed these requirements reducing the average energy consumption of the building by approximately 25%.

Table 4 – NatHERS Results

	Minimum NCC Requirement	Proposed Development Target
Worst case NatHERS rating	5 Stars	5.5 Stars
Overall average NatHERS rating	6 Stars	7.0Stars
Estimated Average Energy Usage	70 MJ/m ²	53 MJ/m ²

4.2 Green Star

The development is being designed to fulfil all requirements in terms of Ecologically Sustainable Design (ESD) and is equivalent to a 4-star Green Star – Design and As-Built v1.3 rating.

Green Star is a comprehensive sustainability design tool which assesses the environmental impact of a building over a range of environmental indicators, from management and ecology to energy and water use, material selection and waste production.

A 4-star Green Star rating requires a total of 45 points to be achieved over nine categories. Sufficient weighted credits have been selected to reach this rating, and further opportunities will be pursued during the design stages of the project.

Table 5 – Green Star equivalent standard score

Total Available Points	Minimum Points required for 4 Star Rating	Proposed Development Target
110 Points	45 Points	51 Points (4 Stars with 10% buffer)

Based on the proposed design response, the predicted performance in each respective environmental category is tabulated in Appendix A. The Green Star Strategy demonstrates how the development is proposing to achieve the 4-star Green Star target rating.

5.0 References

- [1] GHD, Canning Bridge Structure Plan Project Working Group, “Canning Bridge Activity Centre Plan,” City of Melville, City of South Perth, Government of Western Australia, Booragoon/South Perth, 2016.
- [2] Australian Bureau of Statistics, “4610.0 - Water Account, Australia 2015-16,” 2017. [Online]. Available: <http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4610.0Main%20Features32015-16?opendocument&tabname=Summary&prodno=4610.0&issue=2015-16&num=&view=>. [Accessed 05 10 2018].
- [3] J. Pickin and P. Randell , “Australian National Waste Report 2016,” Department of the Environment and Energy and Blue Environment Pty Ltd, Docklands, Vic 3008, 2017.
- [4] International Energy Agency, “Global EV Outlook 2018,” International Energy Agency , 2018. [Online]. Available: <https://www.iea.org/gevo2018/>. [Accessed 05 10 2018].

Appendix A – Green Star Strategy

Project:	25 The Esplanade, Mount Pleasant, WA	Project No.	1030660	CORE POINTS AVAILABLE	Points Likely
Targeted Rating:	4 star	Date:	25/02/2021		
Prepared by:	Camila Mazzo	Revision:	A		
				100	51

Cumulative Score	51
Potential Rating	4 star

NA	CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	CORE POINTS AVAILABLE	Points Likely
	Management				14	
	Green Star AP	To recognise the appointment and active involvement of a Green Star Accredited Professional in order to ensure that the rating tool is applied effectively and as intended.	1.0	Accredited Professional	1	1
	Commissioning and Tuning	To encourage and recognise commissioning, handover and tuning initiatives that ensure all building services operate to their full potential.	2.0	Environmental Performance Targets	-	Yes
			2.1	Services and Maintainability Review	1	1
			2.2	Building Commissioning	1	1
			2.3	Building Systems Tuning	1	1
			2.4	Independent Commissioning Agent	1	0
	Adaptation and Resilience	To encourage and recognise projects that are resilient to the impacts of a changing climate and natural disasters.	3.0	Implementation of a Climate Adaptation Plan	2	0
	Building Information	To recognise the development and provision of building information that facilitates understanding of a building's systems, operation and maintenance requirements, and environmental targets to enable the optimised performance.	4.1	Building Information	1	1
	Commitment to Performance	To recognise practices that encourage building owners, building occupants and facilities management teams to set targets and monitor environmental performance in a collaborative way.	5.1	Environmental Building Performance	1	1
			5.2	End of Life Waste Performance	1	1
	Metering and Monitoring	To recognise the implementation of effective energy and water metering and monitoring systems.	6.0	Metering	-	Yes
			6.1	Monitoring Systems	1	1
	Construction Environmental Management	To reward projects that use best practice formal environmental management procedures during construction.	7.0	Environmental Management Plan	-	Yes
			7.1	Formalised Environmental Management System	1	1
			7.2	High Quality Staff Support	1	1
	Operational Waste	Prescriptive Pathway	8A	Performance Pathway - Specialist Plan	0	
			8B	Prescriptive Pathway - Facilities	1	1
	Total				14	11

	Indoor Environment Quality				17	
<input type="checkbox"/>	Indoor Air Quality	To recognise projects that provide high air quality to occupants.	9.1	Ventilation System Attributes	1	1
<input type="checkbox"/>			9.2	Provision of Outdoor Air	2	2
<input type="checkbox"/>			9.3	Exhaust or Elimination of Pollutants	1	1
<input type="checkbox"/>	Acoustic Comfort	To reward projects that provide appropriate and comfortable acoustic conditions for occupants.	10.1	Internal Noise Levels	1	1
<input type="checkbox"/>			10.2	Reverberation	1	0
<input type="checkbox"/>			10.3	Acoustic Separation	1	1
<input type="checkbox"/>	Lighting Comfort	To encourage and recognise well-lit spaces that provide a high degree of comfort to users.	11.0	Minimum Lighting Comfort	-	Yes
<input type="checkbox"/>			11.1	General Illuminance and Glare Reduction	1	1
<input type="checkbox"/>			11.2	Surface Illuminance	1	0
<input type="checkbox"/>			11.3	Localised Lighting Control	1	0
<input type="checkbox"/>	Visual Comfort	To recognise the delivery of well-lit spaces that provide high levels of visual comfort to building occupants.	12.0	Glare Reduction	-	Yes
<input type="checkbox"/>			12.1	Daylight	2	0
<input type="checkbox"/>			12.2	Views	1	0
<input type="checkbox"/>	Indoor Pollutants	To recognise projects that safeguard occupant health through the reduction in internal air pollutant levels.	13.1	Paints, Adhesives, Sealants and Carpets	1	1
<input type="checkbox"/>			13.2	Engineered Wood Products	1	1
<input type="checkbox"/>	Thermal Comfort	To encourage and recognise projects that achieve high levels of thermal comfort.	14.1	Thermal Comfort	1	1
<input type="checkbox"/>			14.2	Advanced Thermal Comfort	1	0
	Total				17	10

Energy					22	
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Project:	25 The Esplanade, Mount Pleasant, WA	Project No.	1030660	CORE POINTS AVAILABLE	Points Likely
Targeted Rating:	4 star	Date:	25/02/2021		
Prepared by:	Camila Mazzo	Revision:	A		
				100	51

Cumulative Score	51
Potential Rating	4 star

NA	CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	CORE POINTS AVAILABLE	Points Likely
	Greenhouse Gas Emissions	E. Modelled Performance Pathway	15E.0	Conditional Requirement	-	Yes
			15E.1	GHG Emissions Reduction – Prescriptive Pathway	20	4
	Peak Electricity Demand Reduction	Performance Pathway	16A	Prescriptive Pathway - On-site Energy Generation	0	
			16B	Performance Pathway - On-site Energy Generation	2	1
Total					22	5

Transport						
	<input type="checkbox"/> Sustainable Transport	Prescriptive Pathway	17A.1	Performance Pathway	0	
			17B.1	Access by Public Transport	3	3
			17B.2	Reduced Car Parking Provision	1	0
			17B.3	Low Emission Vehicle Infrastructure	1	1
			17B.4	Active Transport Facilities	1	1
			17B.5	Walkable Neighbourhoods	1	1
Total					7	6

Water						
	<input type="checkbox"/> Potable Water	Prescriptive Pathway	18A.1	Potable Water - Performance Pathway	0	
			18B.1	Sanitary Fixture Efficiency	1	1
			18B.2	Rainwater Reuse	1	0
			18B.3	Heat Rejection	2	2
			18B.4	Landscape Irrigation	1	1
			18B.5	Fire System Test Water	1	0
Total					6	4

Materials						
	<input type="checkbox"/> Life Cycle Impacts	Prescriptive Pathway - Life Cycle Impacts	19A.1	Comparative Life Cycle Assessment	0	
			19A.2	Additional Life Cycle Impact Reporting	0	
			19B.1	Concrete	3	1
			19B.2	Steel	1	1
			19B.3	Building Reuse	4	0
			19B.4	Structural Timber	4	0
	<input type="checkbox"/> Responsible Building Materials	To reward projects that include materials that are responsibly sourced or have a sustainable supply chain.	20.1	Structural and Reinforcing Steel	1	1
			20.2	Timber Products	1	0
			20.3	Permanent Formwork, Pipes, Flooring, Blinds and Cables	1	1
	Sustainable Products	To encourage sustainability and transparency in product specification.	21.0	Product Transparency and Sustainability	3	3
	<input type="checkbox"/> Construction and Demolition Waste	Percentage Benchmark	22.0	Reporting Accuracy	-	Yes
			22A	Fixed Benchmark	0	
			22B	Percentage Benchmark	1	1
Total					14	8

Land Use & Ecology						
	Ecological Value	To reward projects that improve the ecological value of their site.	23.0	Endangered, Threatened or Vulnerable Species	-	Yes
			23.1	Ecological Value	3	1
	Sustainable Sites	To reward projects that choose to develop sites that have limited ecological value, re-use previously developed land and	24.0	Conditional Requirement	-	Yes
			24.1	Reuse of Land	1	1

Project:	25 The Esplanade, Mount Pleasant, WA	Project No.	1030660	CORE POINTS AVAILABLE	Points Likely
Targeted Rating:	4 star	Date:	25/02/2021	100	51
Prepared by:	Camila Mazzo	Revision:	A		

Cumulative Score	51
Potential Rating	4 star

NA	CATEGORY / CREDIT	AIM OF THE CREDIT / SELECTION	CODE	CREDIT CRITERIA	CORE POINTS AVAILABLE	Points Likely
<input type="checkbox"/>		remediate contaminate land.	24.2	Contamination and Hazardous Materials	1	1
	Heat Island Effect	To encourage and recognise projects that reduce the contribution of the project site to the heat island effect.	25.0	Heat Island Effect Reduction	1	1
Total					6	4

Emissions				5		
	Stormwater	To reward projects that minimise peak stormwater flows and reduce pollutants entering public sewer infrastructure.	26.1	Stormwater Peak Discharge	1	1
			26.2	Stormwater Pollution Targets	1	0
	Light Pollution	To reward projects that minimise light pollution.	27.0	Light Pollution to Neighbouring Bodies	-	Yes
			27.1	Light Pollution to Night Sky	1	1
	Microbial Control	To recognise projects that implement systems to minimise the impacts associated with harmful microbes in building systems.	28.0	Legionella Impacts from Cooling Systems	1	1
	Refrigerant Impacts	To encourage operational practices that minimise the environmental impacts of refrigeration equipment.	29.0	Refrigerants Impacts	1	0
Total					5	3

Innovation				10		
	Innovative Technology or Process	The project meets the aims of an existing credit using a technology or process that is considered innovative in Australia or the world.	30A	Innovative Technology or Process	10	0
	Market Transformation	The project has undertaken a sustainability initiative that substantially contributes to the broader market transformation towards sustainable development in Australia or in the world.	30B	Market Transformation		0
	Improving on Green Star Benchmarks	The project has achieved full points in a Green Star credit and demonstrates a substantial improvement on the benchmark required to achieve full points.	30C	Improving on Green Star Benchmarks		0
	Innovation Challenge	Where the project addresses an sustainability issue not included within any of the Credits in the existing Green Star rating tools.	30D	Innovation Challenge		0
	Global Sustainability	Project teams may adopt an approved credit from a Global Green Building Rating tool that addresses a sustainability issue that is currently outside the scope of this Green Star rating tools.	30E	Global Sustainability		
Total					10	0

TOTALS	CORE POINTS AVAILABLE	Points Likely
CORE POINTS	100	51
PERCENTAGE SCORE		51.0
INNOVATION POINTS	10	0
TOTAL SCORE	110	51.0



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