CUNDALL

Alexandria View Mindarie

Sustainable Design Assessment Report

Edge Visionary Living

Job No:	1034873
Doc Ref:	1034873-RPT-SY-001
Revision:	—
Revision Date:	15 August 2022

Project title	Alexandria View Mindarie	**Job Number**
Report title	Sustainable Design Assessment Report	1034873

Document Revision History

Revision Ref	Issue Date	Purpose of issue / description of revision
—	15 August 2022	Issued for Development Application (DA)

Document Validation (latest issue)

15/08/2022

X

Principal author

Signed by: Hill, Stefan

15/08/2022

X

Checked by

Signed by: Grimaldi, Oliver

15/08/2022

X

Verified by

Signed by: Grimaldi, Oliver

Executive Summary

This report outlines the Ecological Sustainable Design (ESD) strategy for the proposed Apartment complex located at 50 Alexandria View Mindarie, Western Australia. The proposed project will be a diverse and sustainable housing development boasting sea views, high levels of liveability for all residents. The priorities of the project stand to be sustainability, resident comfort, and balance between the public, private and natural environments.

The development location falls within the City of Wanneroo local area boundary.

This report outlines how the proposed development aligns with the City of Wanneroo's Sustainability Vision and how it meets specific guiding principles within the Local Environmental Strategy 2019, Climate Change Adaptation and Mitigation Strategy, Energy Reduction Plan, Urban Water Management – LPP 4.4 and the Western Australian Climate Policy. Table 1 illustrates the environmental and sustainability outcomes and whether the proposed project shall align with them.

Table 1 City of Wanneroo Sustainability Vision requirements

Strategy/Plan	Guiding Principle/Sustainability Strategy No.	Requirement will be met	Evidence
Local Environmental Strategy	3.1 Resource Management	✓	• The proposed development seeks to preserve, protect, and enhance the natural environment where possible. Refer to Sections 5, 7 and 8. • Water efficient fixtures and appliances will be installed
	3.2 Enhanced Environment	✓	• Use of vegetation, water, green spaces, SRI approved roofing and solar PV car park shading will actively reduce the heat island effect. Refer to Section 8. • The project has engaged an Aboriginal Consultation Services consultant to develop a cultural framework for the project. Refer to Section 9.
	3.3 Reduce, reuse, recycle waste	✓	• A reduction of both constructional and operational waste is a major target which will be pursued. Refer to Section 5.
	3.4 Activated Places	✓	• Various communal safe spaces and facilities will be provided within the development. Refer to Section 9.
	3.5 Connected and Accessible City	✓	• The development is near Clarkson train station as well as having multiple bus stops in close walking distance. Refer to Section 6.

	3.6 Housing Choice	✓	• The development will have a diversity of housing to reflect the changing community needs.
Climate Change Adaptation and Mitigation Strategy	3.2 Reduce overall Fleet Emissions	✓	• Implementation of EV charging bays to enable the transition to more efficient vehicles (hybrid or electric)
Energy Reduction Plan	Explore energy efficiency opportunities that are possible to consider for future implementation in the key load areas (lighting, HVAC, water pumping)	✓	• All lights will be fitted with LED's and all communal areas will include occupancy sensing PIR's. Refer to Section 3.2
Urban Water Management - LPP	4.0 Implement Water Sensitive Urban Design (WSUD)	✓	• Implementation of wise-water landscaping aims to achieve WSUD requirements. Refer to Section 4.

Table 2 Western Australian Climate Policy

Strategy/Plan	Guiding Principle/Sustainability Strategy No.	Requirement will be met	Evidence
Western Australian Climate Policy	Transition towards net zero by 2050	✓	• The development will be designed with no fossil fuels for cooking, heating, and hot water. Refer to Section 3.0
	Energy efficient social housing, reducing carbon emissions	✓	• The project targets an average 8 Star NatHERS rating reducing the energy requirements of the project. Refer to Section 3.0
	Climate Resilience Action Plan 2022 – 25 Develop a coordinated, collaborative plan to support Western Australian industries, cities, and regions to identify and manage climate impacts and enhance climate resilience.	✓	• A key component of the Green Star rating target is designing the building to be resilient to future changing climate.

Contents

Figures

Tables

1.0 Introduction

The proposed building will be located at 50 Alexandria View, Mindarie in Western Australia. The development will be a mixed-use complex within the City of Wanneroo, adjacent to Clayton's Beach and the nearby local marina. It is located approximately 36 km north of Perth's CBD and 10 km northwest of Joondalup.

The new development will provide the northern suburbs of Perth with a diverse and synergistic living experience by the sea. The development will comprise of a main living complex featuring a townhouse topology to the lower two floors, apartment living above, green space focussing on native and endemic species of plants to act as coastal frontage, basement parking and potential pedestrian and bicycle access.

Edge Visionary Living with Hillam Architects aim to provide an exceptional residential living experience with panoramic views of the Indian Ocean and five-star amenities including a gymnasium, outdoor pool, and BBQ area. The project seeks to adhere to the relevant design principles; context and character, landscape quality, built form and scale, functionality and build quality, sustainability, amenity, legibility, safety, community and aesthetics. Within the sustainability category lies the goals of a 4-star Green Star Buildings rating, an 8-star NatHERS rating and Section J NCC compliance.

Figure 1.2 Visualisation of the Alexandria View development

Figure 1.1 Aerial view showing the site of the Alexandria View development

1.1 City of Wanneroo Local Environmental Strategy

The purpose of the Local Environmental Strategy by the city of Wanneroo (2019) is to provide a framework that seeks to protect and improve the quality of both the City's built and natural environments. This framework known as the Strategic Community Plan (SCP) includes identification of threats, environmental assets and values, as well as opportunities for improvement or protection. It is organised into six outcomes; resource management, enhanced environment, RRR of waste, activated places, connected and accessible city and housing choice. These outcomes drive the Local Environmental Strategy that seeks to govern the City's current and future projects and developments.

1.2 Sustainability Targets

The development is designed to fulfil the requirement in terms of sustainable design and aims to achieve a minimum of a 4 Star Green Star Buildings v1 rating as well as an 8 Star NatHERS average rating. The sustainability initiatives herein are aligned with the Green Star Buildings v1 submission guidelines.

2.0 Indoor Environmental Quality

The Indoor Environment Quality of a building aims to achieve sustainability performance improvements in a manner that also improves occupants' experience of the space. Sustainable buildings are designed for people and reductions in energy use should never be made at the expense of the occupants' health and wellbeing.

A holistic approach to sustainability will result in multiple benefits both in energy efficiency and encouraging occupant wellbeing. This can be achieved by improvements to air quality through appropriate ventilation, the provision of high levels of thermal, visual, and acoustic comfort, reduction of occupant stress and the creation of a low-toxicity environment through the reduction/removal of pollutants.

2.1 Design Initiatives

The following table summarises the specific initiatives included in the design in relation to Indoor Environment Quality:

Table 3 Indoor Environment Quality initiatives

Design Focus	Intended Design Initiatives
Thermal comfort	▪ High-performance glazing ▪ External shading through set back façade lines ▪ All rooms to receive direct sunlight
Natural ventilation	▪ Natural cross ventilation for most of the proposed rooms and indoor public spaces ▪ All rooms will have high- and low-level openings ▪ Rooms maximised to optimise natural ventilation ▪ Natural light and ventilation to lobbies and corridors
Daylight	▪ Large windows with moderate visual light transmittance (VLT) optimised for sufficient natural daylight ▪ 75% of dwellings to obtain at least 2 hours of direct sunlight between 9am and 3pm
External Views	▪ Good orientation with views to ocean and to landscaped gardens/vegetation
Hazardous materials and VOC's	▪ Specification of low VOCs in paints adhesives and sealants ▪ Low formaldehyde in engineered woods ▪ At least 95% of relevant products to comply
Internal lighting levels	▪ All lighting will be LED or low energy and flicker-free lighting.
Acoustics	▪ Acoustic separation between apartments/houses ▪ Compliance with acoustic requirements for external and internal noise levels ▪ Acoustic separation and internal noise levels complying with Table 1 of AS/NZS2107:2016

2.2 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. To control internal comfort and minimise excessive heat loss in winter and heat gains in summer, a number of strategies will be investigated for the proposed development. The following points shall be considered when designing the Alexandria View complex:

- Façade design and glass selection are very important; heat gains and losses must be moderated, and thermal bridging should be avoided. Double glazing systems are considered for this development to improve the thermal performance of the building envelope.

- The façade should be well sealed to avoid drafts and air leakage.
- External shading and cool winds with cross ventilation prevent excessive heat gains in summer.
- As all hotel rooms will receive direct sunlight, solar heat gains will aid building performance in winter.

2.3 Shading Devices

Shading is a critical component of the building design. Large overhangs, both vertical and horizontal, should be incorporated, and the north facing glazing should aim to reduce the amount of direct solar radiation for all times during the year. The development provides shading to the glazed facades by means of extended floor plates, shading and semi-enclosed balconies.

Figure 2.1 Alexandria View building design showing potential shading devices for glazing

2.4 Glazing Performance

The proposed high-performance glazing provides solar control to prevent summer heating while allowing useful passive solar heating in winter. The low U-value of the glazing would minimise the conductive loss or gain. These result in an improved thermal comfort, improved energy rating and subsequently a reduced overall carbon footprint of the development.

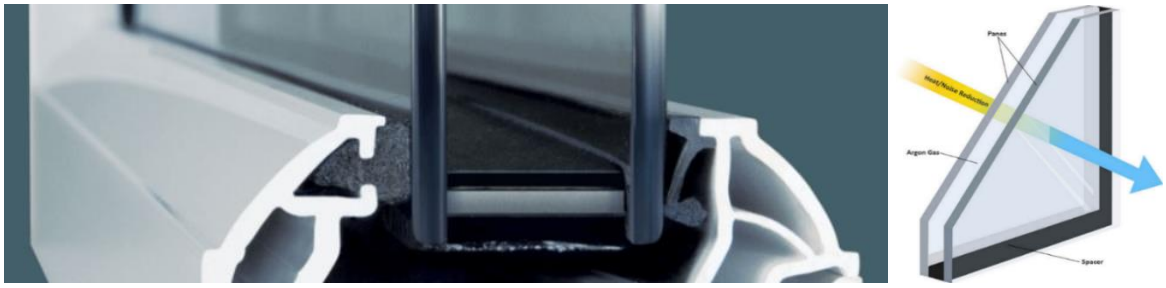

Figure 2.2 Double glazing options are considered for the development

2.5 Emissions & Toxicity

Volatile organic compounds (VOCs) are emitted from certain solids or liquids as toxic gases. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOC's 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).

The development will aim to specify materials with low emissions content including low-VOC and low formaldehyde content to avoid contaminating the indoor air environment.

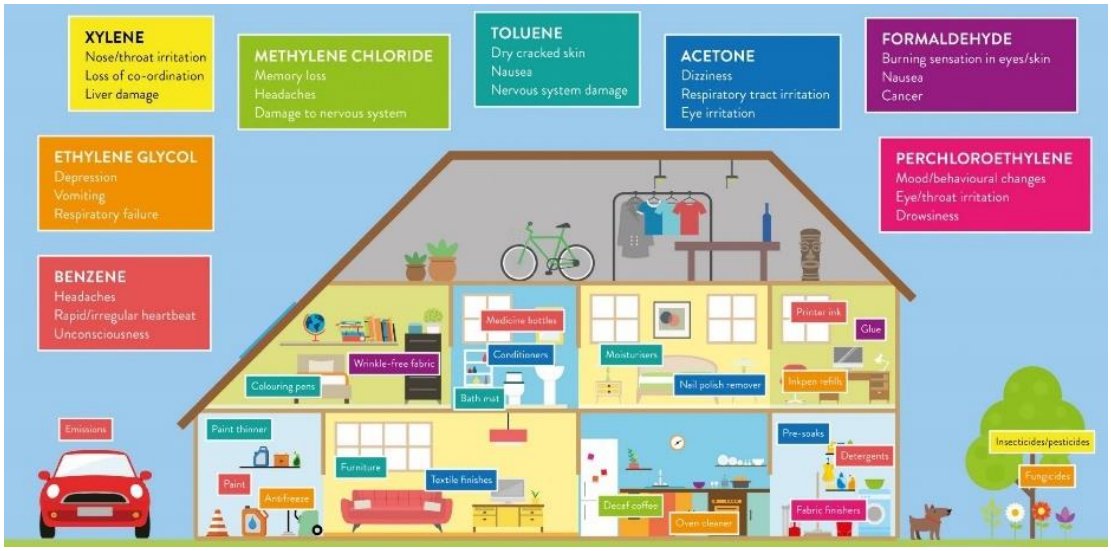

Figure 2.3 VOCs that result in sick building syndrome

2.6 Natural Lighting

Appropriate daylight 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 must be avoided. The hotel rooms shall be designed to have large sliding doors to the balconies in addition to large full height windows to maximise daylight levels while shading devices are proposed to reduce glare.

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

- Given the extent of proposed glazing, glass with a moderate visual light transmittance (VLT) allows sufficient daylight to penetrate the space.
- Light internal colours improve indoor lighting levels.

Additionally, all external landscaped spaces will only be illuminated by downward facing light fittings so as to reduce the negative effects of light pollution (also refer to Section 8.3).

2.7 Cross Ventilation

It is proposed that 70% of the dwellings within the development achieve natural ventilation, exceeding the Design WA requirement. This is obtained due to the broad frontage to the south westerly ocean breezes. The façade design optimises prevailing wind exposure with highlight windows also improving air circulation throughout the apartments.

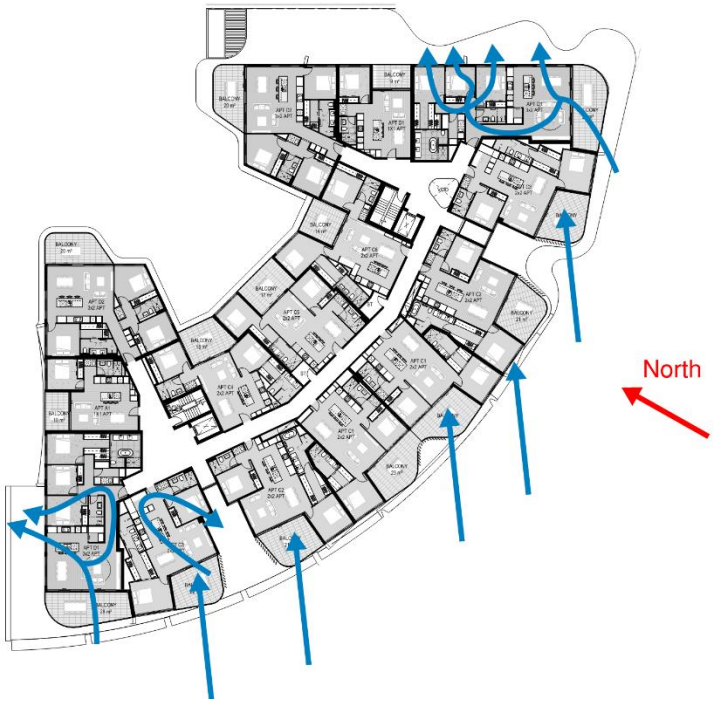

Figure 2.4 Alexandria View building showing potential design provisions for ventilation cross ventilation

2.8 Airtightness and Thermal Bridging

Airtightness is the fundamental building property that impacts infiltration and exfiltration - the uncontrolled inward and outward leakage of outdoor air through cracks, interstices, or other unintentional openings of a building, caused by pressure effects of the wind and/or stack effect. The development will be designed with airtightness in mind for architectural detailing and specification to limit air leakage from the building envelope elements such as glazing systems and external walls.

Similarly, thermal bridging is the transference of heat through a wall at a point through which it can bypass the insulating layers of the structure. It is through these points in a building's envelope that they can experience unwanted heat gains and/or losses and as such should be considered when designing for sustainability and energy efficiency. The architectural and structural detailing on the project will consider the issue of thermal bridging and will apply design principles to avoid unwanted heat losses or gains wherever possible through thermal breaks and other measures.

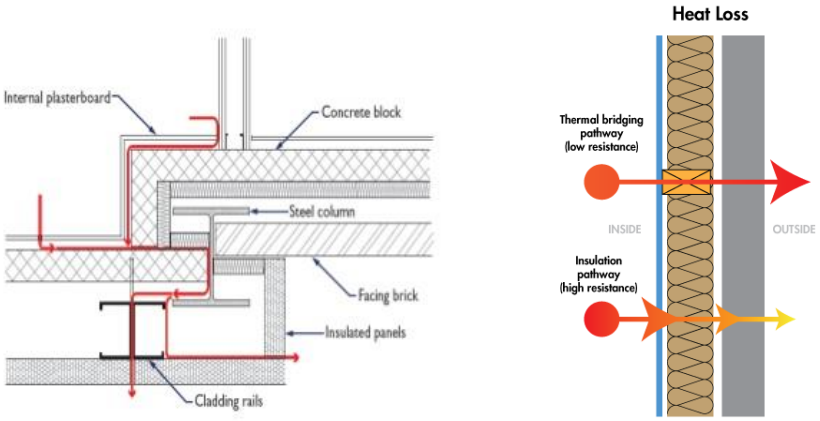

Figure 2.5 Exemplar continuous airtightness line of building details (left) and thermal bridging principle (right)

3.0 Energy Efficiency

It is well established that the energy use of a building is generally the greatest contributor to greenhouse gas emissions. The following sections set out design strategies utilised for this development to reduce the building's energy demand and greenhouse gas emissions as per the City of Wanneroo Environmental Strategy Guidelines.

3.1 Design Initiatives

Table 4 summarises the specific initiatives included in the design in relation to energy efficiency.

Table 4 Energy efficiency initiatives

Design Focus	Intended Design Initiatives
Building fabric	▪ High-performance fabric and insulation.
Operating energy and peak demand reduction	▪ High efficiency building services. ▪ High-performance glazing.
On-site energy generation	▪ Solar PV panels installed on-site.
Energy sub-metering	▪ Smart metering installed.
Air leakage	▪ The building will be designed and built with airtightness in mind.
Lighting efficiency	▪ All lighting will be LED, low energy lighting. ▪ Target lighting power density reduction by at least 10%.
Ventilation and air-conditioning	▪ Energy-efficient HVAC will be installed. ▪ Air conditioning equipment will be at least 3-star as per AS 3823.2-2011.
Appliances and equipment	▪ All appliances installed will be energy and water efficient. ▪ Appliances to have a minimum Energy Star rating of 1-star below the maximum.
Hot Water System	▪ Roof mounted heat pump and centralised hot water system.

3.2 Artificial Lighting and Controls

All lights will be fitted with light emitting diodes (LEDs), including lighting in the 'communal' corridors, stairwells, garage, and external lighting. All common area lighting will incorporate light controls such as occupancy sensing (PIRs) and time switches to reduce lighting consumption when lighting is not required.

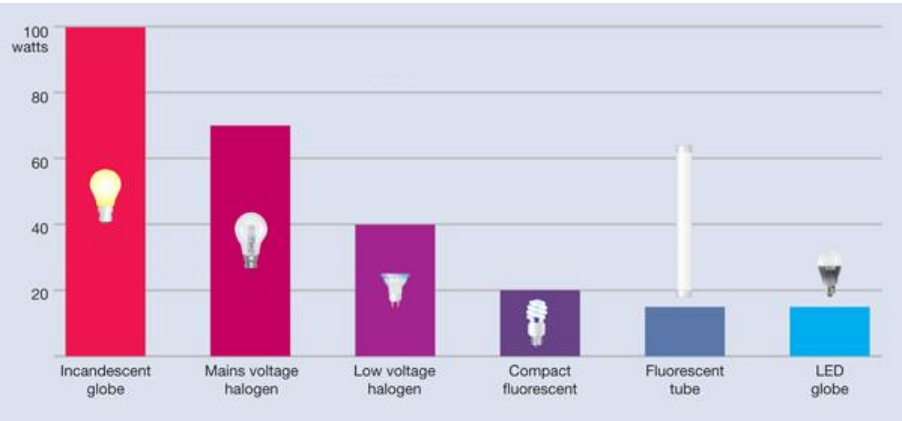

Figure 3.1 Comparison of LED lighting with other conventional lighting

3.3 Transparent Consumption

Provision for smart metering of energy and water usage are being considered. The software could also provide a snapshot view of how the buildings are performing.

3.4 Commissioning and Building Tuning

Comprehensive pre-commissioning and commissioning activities will be undertaken for all building systems as a standard practice for the development.

Further to commissioning, seasonal building tuning will be considered on the building for at least 12 months following occupancy to ensure systems are performing to their design potential at full and part load conditions. Quarterly adjustments and measurements for the first 12 months after occupation and a review of building system manufacturer warranties will help improve the building's energy performance.

3.5 Solar Photovoltaic Panels

Solar Photovoltaic (PV) panels will be installed on-site to supply power. The roof will be designed to allow for an initial array of 30kWp with allowance for future expansion of the array.

The development also aims to use 100% renewable energy sources (Green Power) from grid purchased electricity.

4.0 Water Efficiency

The location of the development in Western Australia is considered a drying climate and as such, water conservation is critically important.

The following sections set out design strategies utilised for this development to reduce its overall water consumption.

4.1 Design Initiatives

The following table summarises the specific initiatives included in the design in relation to water efficiency:

Table 5 Water efficiency initiatives

Design Focus	Intended Design Initiatives
Potable water consumption	▪ All water fittings and fixtures to be water efficient
Water sourcing	▪ The lowest impact water source will be acquired, where possible ▪ Investigation into water harvesting and rainwater catchment for use in irrigation and for other non-potable water uses will be carried out
Water metering	▪ Smart metering installed
Landscape irrigation	▪ All landscape irrigation will be drip irrigation with moisture sensing override ▪ Investigation into the use of grey water within the facility will be carried out ▪ Best practise water sensitive urban design principles will be incorporated into the landscaping

4.2 Water Fixtures & Fittings

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

Table 6 Proposed water fittings WELS rating

Fixture / Fitting Type	Minimum WELS Rating
Taps	5 Star
Urinals	5 Star
Toilets	4 Star
Showers	3 Star (≤ 7.5 L/min)
Dishwashers	5 Star
Washing machine	4 Star

4.3 Water-Wise Landscaping

The development will incorporate best practise water sensitive urban design principles into the landscaping and will be made up of hardy natives and other endemic, low-water vegetation. By planting low-water vegetation both environmental and financial benefits are offered; the reintroduction of natives could help improve the quality of local biodiversity and minimise erosion of the coastal area.

4.4 Drip Irrigation

A major amount of potable water usage goes back to landscape irrigation. To reduce the amount of water used for the landscaped areas, a drip system with moisture sensor control may be installed for irrigation.

5.0 Building Materials

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 procurement of materials and construction of the facility and how these impacts have been reduced when compared to typical developments of this nature. The building will aim to reduce the total embodied energy and carbon considered in the construction.

5.1 Design Initiatives

The following table summarises the specific initiatives included in the design in relation to building materials:

Table 7 Building materials initiatives

Design Focus	Intended Design Initiative
Embodied carbon in the building materials	▪ The building design and material selection will reduce the extent of environmental impact as much as possible
Concrete	▪ Recycled concrete will be used for the construction of the structures, the floors, service roads and hard stand areas around the facilities where possible
Sustainable timber	▪ It is targeted that the majority of the timber used in the building and construction is from a sustainable source or reused
Permanent formwork, pipes, ducts, cables	▪ PVC products will meet Best Practice Guidelines for PVC. ▪ Target is at least 90% of all PVC products are to meet best practice guidelines for PVC.
Structural and reinforcing steel	▪ Target is that the majority of steel used in the building will be procured from an energy-reducing processing plant and a responsible steel maker.

5.2 Embodied Carbon

Materials for the construction of the development will be sourced from suppliers located as close as possible to the site to minimise the carbon footprint related to transportation. The materials used in the construction of the complex are capable of being recycled in the future.

5.3 Ultra-Low VOCs

The development will aim to specify materials with low emissions content including ultra-low-VOC paints.

6.0 Transport

Sustainable projects should facilitate a reduction on the dependency of occupants on using a private car and is an important means of reducing overall greenhouse gas emissions. The use of motor vehicles directly contributes to climate change through the direct emissions that result from car operations.

If reliance on individual motor vehicle transportation is to be reduced, it is necessary to maximise alternative transportation options. This may include initiatives that encourage and make possible the use of mass transport options.

6.1 Design Initiatives

The following table summarises the specific initiatives included in the design in relation to transport:

Table 8 Transport initiatives

Design Focus	Intended Design Initiative
Providing bike storage	▪ Bike storage will be provided for guests and staff, located adjacent to the entrance and near end of trip facilities
Low emission vehicle infrastructure	▪ Car parking bays and infrastructure for electric vehicles (EV) ▪ At least 5% of car bays will be equipped with the infrastructure provisions for installing EV chargers. ▪ Charging bays for electric bicycles

6.2 Public Transportation

The development is well situated to access public transport options. Figure 6.1 shows Alexandria View's proximity to Clarkson train station. In addition to this, there are bus stops along Ocean Falls Boulevard, and Rothesay Heights operating bus 481 which travels between Quinns Rocks and Clarkson train station.

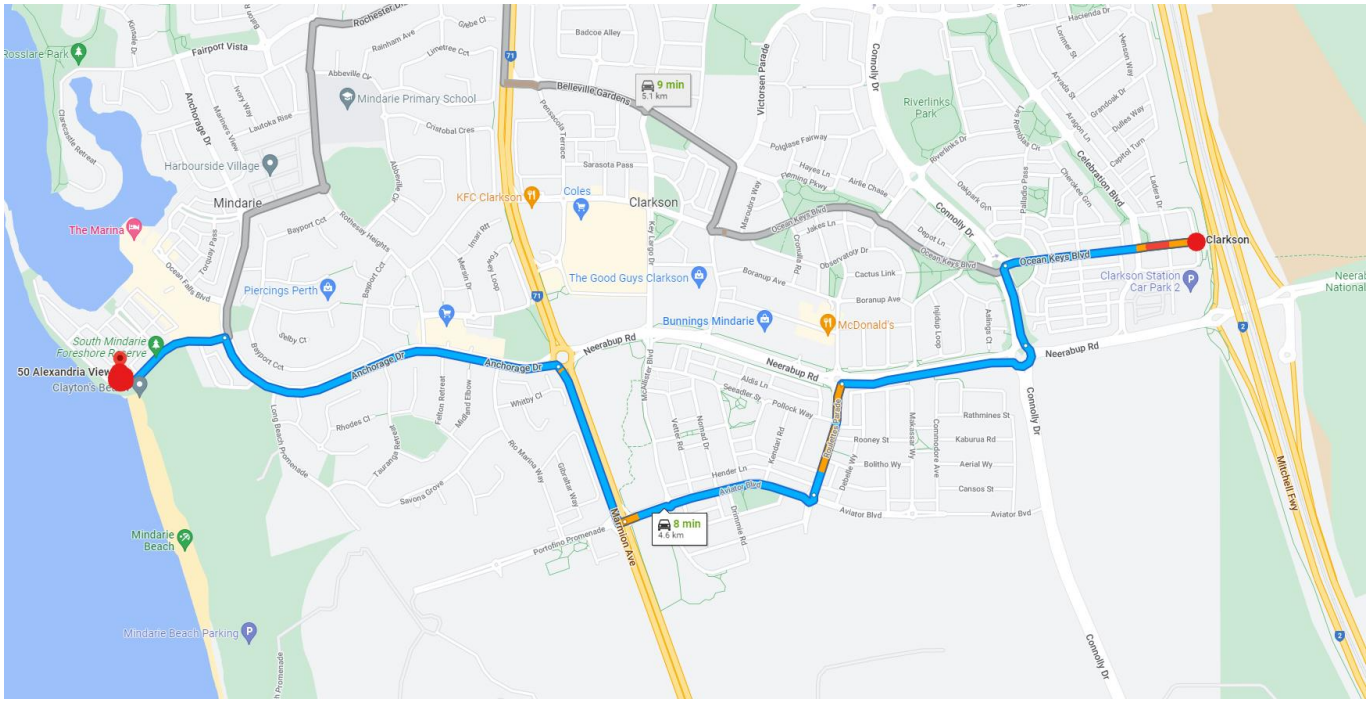

Figure 6.1 Alexandria View site location and proximity to public transport (Clarkson Station)

6.3 Facilities for Sustainable Transport

To encourage the use of bikes and other sustainable modes of transport, such as the electric scooter, the development will include bike storage areas with facilities to actively cater to cyclists.

If a guest were to cycle instead of travelling with a conventional motor vehicle, each kilometre a person cycles instead of driving would save approximately 0.2 kg of CO_2 (Commonwealth of Australia, 2017). Furthermore, cycling will encourage an active and healthy lifestyle for the residents.

Figure 6.2 Sustainable transportation depiction

6.4 Electric Vehicles

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 (International Energy Agency, 2018).

The proposed development intends to support the uptake of low-emissions and electric vehicles. A number of EV charging bays are planned for implementation within the proposed development.

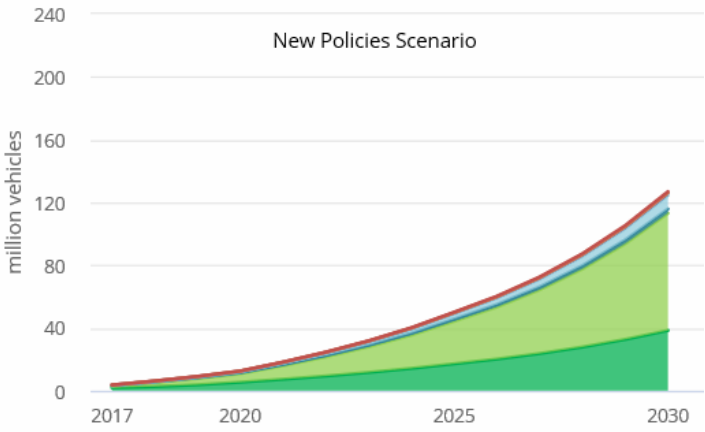

Figure 6.3 Global Electric Vehicle Deployment by 2030

7.0 Waste Management

The main objectives for waste management strategies for construction and operational waste are to ensure that waste is avoided and recycled during design, construction, and operation.

Waste within a building construction context can be avoided by encouraging the selection of lower-impact and long-term materials. Operational waste to landfill can be reduced by providing relevant and easily accessible facilities for recyclable waste and other waste that can be diverted from landfill such as organic waste, batteries, or e-waste.

7.1 Design Initiatives

The following table summarises the specific initiatives included in the design in relation to waste management:

Table 9 Waste initiatives

Design Focus	Intended Design Initiative
Construction waste	▪ The amount of construction waste diverted to landfill will be minimised ▪ A minimum of 90% of waste from construction is targeted to be diverted from landfill
Operational waste management	▪ Adequate facilities will be provided to store separate waste streams ▪ A bin store will be provided to cater for different waste streams ▪ Good external and internal access to the storeroom to be provided ▪ A policy has been created and will be adopted to discourage the use of single use plastics within the development ▪ It is a target that all water sold on site will be in recyclable paper cartons, which can be refilled at free hydration stations
Access and storage for recycling and green waste	▪ Recycling and organic/food waste are addressed in the operational waste concept ▪ Three waste streams will be collected and separated in the building including landfill and recycling waste. ▪ Composting/organic waste will be considered as a waste stream

7.2 Building Materials and Resource Minimisation

In 2014-15 Australia produced the equivalent of 565 kg per capita of municipal waste and 831 kg of construction and demolition waste. While around 60% of this waste is recycled, a large part still goes to landfill (Pickin & Randell , 2017). A reduction of both construction and operational waste is therefore an important target for the Alexandria View development.

Where necessary to clear part of the site to accommodate for the development, trees will be retained, where possible, and used as part of the landscaping features around the development. Similarly, boulders and rocks evacuated from site will be retained for landing too.

7.3 Operational Waste Management

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. At least three streams will be covered including landfill, recycling and a third stream which may be organic/food waste.

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. Some strategies that will be investigated include:

- Innovative waste separation and collection strategies to allow materials to be isolated for reuse;
- A purchasing policy which aims to minimise waste from products and packaging, encourage the use of products which have minimum environmental impact; and
- Manufacturers and suppliers will be encouraged to take full responsibility for the life cycle impact of products including ownership at end of life.

7.4 Composting Organic Waste Strategy

The development will explore the possibility of recycling all forms of food and organic waste by identifying waste streams and incorporating a strategy that reduces food or organic waste going to landfills. This will also depend on the development of the City of Wanneroo's potential FOGO collection strategy.

8.0 Urban Ecology

With continuously growing cities, urban ecology plays a large role in conserving biodiversity and improving the quality of life for urban residents. Well planned buildings and landscape architecture not only protects and enhances biodiversity, but it also enables sustainable landscaping, such as low water use, low fertiliser requirements and local native and indigenous plant species selection. If possible, remnant indigenous plant communities should be managed and protected.

8.1 Design Initiatives

The following table summarises the specific initiatives included in the design in relation to urban ecology:

Table 10 Urban ecology initiatives

Design Issue	Intended Design Initiatives
Maintaining/enhancing ecological value	▪ Native and endemic plant species will be used in the soft landscaping to attract inspects, birds and other small wildlife to the area ▪ Existing flora and fauna communities will be preserved as far as possible
Heat Island Effect Reduction	▪ Use of vegetation, water, green spaces, balcony and frontage shading will actively reduce the heat island effect ▪ A minimum of 75% compliance is targeted
Mitigation of light pollution	▪ All external light fittings will be pointing downwards to mitigate the effect of urban light pollution.

8.2 Minimising Heat Island Effect

The heat island effect describes the condition where urban areas have a higher average temperature than its rural surroundings due to the built environment's makeup. The use of light roof materials (where possible), combined with shaded and landscaped areas, can significantly reduce the heat island effect, and contribute to further energy savings.

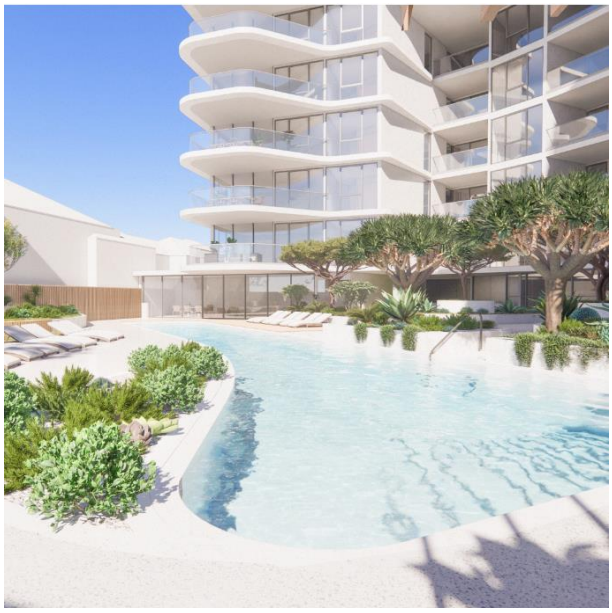

Figure 8.1 Alexandria View building showing potential design provisions for heat island effect including landscaping and pool w/shading

8.3 Light Pollution

Light pollution is an environmental issue that is becoming more of a problem every year as cities continue to grow in both size and population density. Excessive amounts of light being projected upwards is not only a waste of energy and resources but has also been proven to make a negative impact on the local wildlife by affecting various species' vision, mating, nesting, and built-in migration instincts.

Similar effects have been found in humans, with some people struggling to sleep and relax with prolonged exposure to artificial daylight and glare from poorly fitted external lights. The idea of reducing light pollution through sensible light fittings can save the site owners financially by reducing wasted energy and increasing lighting efficiency whilst simultaneously contributing positively to the health and wellbeing of the surrounding natural environment.

The project targets to have all external light fittings pointing downwards, mitigating the effects of light pollution.

Figure 8.2 Light and energy usage of external lighting

9.0 Community & Culture

For a healthy and balanced life, it is considered very important to have a workplace and a sense of inclusion in society. Creating a sustainable community requires that there is an infrastructure to bring people together and create work opportunities.

9.1 Employment Opportunities

The Alexandria View complex will create new opportunities for work with facilities such as:

- Formal and casual dining areas
- Fitness, wellness, allied health, and sports recovery precinct
- Co-working precinct.

9.2 Common Community Spaces

The Alexandria View complex will also provide the community with common places to gather, such as:

- Outdoor communal pool
- Poolside BBQ area, with cabanas
- Landscaped garden and recreation area
- Gymnasium / health facilities and sauna
- Book retreat zone
- Ocean viewing / sunset deck.

9.3 Cultural Framework

The Alexandria View complex recognises the importance of incorporating cultural themes into the development's landscape, wayfinding, public art and built form. Therefore, the project will develop a cultural framework for the project and recognise and celebrate the significance of cultural, social, and built heritage, including local indigenous and multicultural groups.

10.0 Codes and Ratings

The development 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 project's response.

10.1 National Construction Code Section J

The objective of this section of the code is to reduce a building's greenhouse gas emissions. Reduction in emissions are achieved by setting minimum energy efficiencies and/or requirements which ensure a building is built in such a way to minimise the energy demands required. The development will aim to exceed these expectations in most areas to ensure the building operates efficiently.

10.2 Green Star Buildings

The development is being designed to fulfil all requirements in terms of Ecologically Sustainable Design (ESD) and is aiming to achieve a 4 Star Green Star rating under the Buildings v1 tool. Green Star is a comprehensive sustainability design tool that 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 15 points to be achieved in the aforementioned categories. Sufficient weighted credits have been selected to achieve this requirement rating, and further opportunities will be pursued during the design stages of the project.

Based on the proposed design response, the predicted performance in each respective environmental category is tabulated in the Scorecard in Appendix A. The sustainability strategy of this development demonstrates how the development is proposing to achieve the 4 Star Green Star rating.

Total Points Available	Minimum Points Required for 4 Star rating	Points Target for Development
100 points	15 points	20 points

11.0 References

Australian Bureau of Statistics. (2017). *4610.0 - Water Account, Australia 2015-16*. Retrieved 10 05, 2018, from http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4610.0Main%20Features32015-16?opendocument&tabname=Summary&prodno=4610.0&issue=2015-16&num=&view=

Commonwealth of Australia. (2017). *Green Vehicle Guide*. Retrieved from Vehicle Emissions.

International Energy Agency. (2018). *Global EV Outlook 2018*. (International Energy Agency) Retrieved 10 05, 2018, from https://www.iea.org/gevo2018/

International Energy Agency. (2020). *Global EV Outlook 2020*. Retrieved from International Energy Agency: https://iea.blob.core.windows.net/assets/af46e012-18c2-44d6-becd-bad21fa844fd/Global_EV_Outlook_2020.pdf

Pickin, J., & Randell , P. (2017). *Australian National Waste Report 2016.* Docklands, Vic 3008: Department of the Environment and Energy and Blue Environment Pty Ltd.

Appendix A – Green Star Building Submission Planner

Please see overleaf.

Submission planner

Summary

Registering from	2020 onwards		
Net zero carbon in operations targeted	No	**Targeted Green Star rating**	4 Star
Minimum expectations met	Yes	**Core points targeted**	21
Credit Achievement points targeted	21	**Leadership points targeted**	0
Exceptional Performance points targeted	0	**Total points targeted**	21

	Credit	Minimum Expectation	Credit Achievement	Exceptional Performance	Total points available	Targeted performance level	Total points targeted
	Responsible				**17**		
1	Industry Development	-	1	-	**1**	Credit Achievement	**1**
2	Responsible Construction	•	1	-	**1**	Credit Achievement	**1**
3	Verification and Handover	•	1	-	**1**	Credit Achievement	**1**
4	Operational Waste	•	-	-	**0**	Minimum Expectation	•
5	Responsible Procurement	-	1	-	**1**		
6	Responsible Structure	-	3	2	**5**		
7	Responsible Envelope	-	2	2	**4**		
8	Responsible Systems	-	1	1	**2**		
9	Responsible Finishes	-	1	1	**2**		
						Total	**3**
	Healthy				**14**		
10	Clean Air	•	2	-	**2**	Credit Achievement	**2**
11	Light Quality	•	2	2	**4**	Credit Achievement	**2**
12	Acoustic Comfort	•	2	-	**2**	Minimum Expectation	•
13	Exposure to Toxins	•	2	-	**2**	Minimum Expectation	•
14	Amenity and Comfort	-	2	-	**2**	Credit Achievement	**2**
15	Connection to Nature	-	1	1	**2**		
						Total	**6**
	Resilient				**8**		
16	Climate Change Resilience	•	1	-	**1**	Minimum Expectation	•
17	Operations Resilience	-	2	-	**2**	Credit Achievement	**2**
18	Community Resilience	-	1	-	**1**		
19	Heat Resilience	-	1	-	**1**	Credit Achievement	**1**
20	Grid Resilience	-	3	-	**3**		
						Total	**3**
	Positive				**30**		
21	Upfront Carbon Emissions	•	3	3	**6**	Minimum Expectation	•
22	Energy Use	•	3	3	**6**	Credit Achievement	**3**

23	Energy Source	•	3	3	**6**	Credit Achievement	**3**
24	Other Carbon Emissions	-	2	2	**4**		
25	Water Use	•	3	3	**6**	Minimum Expectation	•
26	Life Cycle Impacts	-	2	-	**2**		
						Total	**6**
	Places				**8**		
27	Movement and Place	•	3	-	**3**	Minimum Expectation	•
28	Enjoyable Places	-	2	-	**2**		
29	Contribution to Place	-	2	-	**2**		
30	Culture, Heritage and Identity	-	1	-	**1**		
						Total	
	People				**9**		
31	Inclusive Construction Practices	•	1	-	**1**	Credit Achievement	**1**
32	Indigenous Inclusion	-	2	-	**2**		
33	Procurement and Workforce Inclusion	-	2	1	**3**		
34	Design for Inclusion	-	2	1	**3**	Credit Achievement	**2**
						Total	**3**
	Nature				**14**		
35	Impacts to Nature	•	2	-	**2**	Minimum Expectation	•
36	Biodiversity Enhancement	-	2	2	**4**		
37	Nature Connectivity	-	2	-	**2**		
38	Nature Stewardship	-	2	-	**2**		
39	Waterway Protection	-	2	2	**4**		
						Total	
	Leadership				**0**		
40	Market Transformation	-		-	**0**		
41	Leadership Challenges	-		-	**0**		
						Total	

Cundall Johnston & Partners PTY
Level 2, 585 Hay St, Perth WA 6000
Tel:+61 (0)8 9421 3700
Asia Australia Europe MENA UK and Ireland
www.cundall.com

ONE PLANET LIVING | An initiative by Bioregional