

Sustainable Design Assessment – DA Stage

Jindalee Development – Apartment/Townhouses

Date: 17 July 2026
Our Reference: 24-23914
Client Job Number: 2025-73

Project Address: Lot 9052 (#500K) Maritime Drive, Jindalee WA 6036
BCA Climate Zone: 5

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Report Details		
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Revision Date: 17 July 2026	Reason for Revision	

Document Control

Doc name:	ESD Report - Lot 9052 (#500K) Maritime Drive, Jindalee WA (24-23914)				
Version	Date	Author		Reviewer	
2	17/07/2026	Muneeb Ahmed	MA	Nathan Peart	NP
	ESD report				

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1 PROJECT INFORMATION

This report has been commissioned to detail the sustainability commitments for the proposal at Lot 9052 (#500K) Maritime Drive, Jindalee WA 6036 as detailed in section 2. The proposal is for around 129 apartments and townhouses to be built on a site area of approximately 4776 m². The site is currently empty, cleared and available for development, with public open space to its north-east.



Figure 1: Site Location (Source: Google maps)



Figure 2: Prevailing winds & Site (Source: Hubble Design)

The proposal is a 6-storey apartment building with 2 basement carpark levels and 8 townhouses along Maritime Drive. The site is located within a bespoke coastal development in Jindalee. The development lies west of major transport routes, providing highly convenient access options.

2 COMPLIANCE OVERVIEW

2.1 Planning Policy

This environmentally sustainable design report has been prepared to demonstrate the project's alignment with the integrated design framework of **State Planning policy 7.0** (Design of the Built Environment) and the specific performance requirements of **SPP 7.3 Residential Design Codes** (Volume 2 – Apartments).

The proposal responds to the site-specific sustainability objectives outlined in the **City of Wanneroo District Planning Scheme no. 2** and **Jindalee North Local Structure Plan (LSP 88)**, with particular emphasis on coastal resilience, water-sensitive urban design and urban heat island mitigation.

The development seeks to exceed the minimum "Acceptable Outcomes" for solar access and natural ventilation, ensuring long-term thermal comfort and reduced operational carbon in accordance with the City's commitment to sustainable built form.

3 KEY SUSTAINABILITY CONSIDERATIONS

3.1 Contextual Design and Coastal Microclimate Response

The architectural expression of the development is deeply rooted in the local modern character of Jindalee, prioritizing a seamless transition between indoor and outdoor living. By utilizing a palette of light limestone and feature stone walls, the building creates a high-thermal-mass skin that regulates internal temperatures naturally. This is complemented by extensive perimeter landscaping and oversized balconies that serve as 'outdoor rooms', encouraging natural cross-ventilation and reducing the reliance on mechanical cooling. The integration of light-coloured materials helps reflect solar radiation to maintain a cooler microclimate for both residents and the surrounding streetscape.

3.2 Passive Solar Design & Thermal performance

The building envelope is to be designed to exceed the minimum NCC 2025 requirements, targeting a development-wide NatHERS average of at least 7.0 stars.

Prioritising a 'passive-first' approach, the design optimises solar orientation to ensure at least 70% of apartments/units achieve, as a minimum, 2 hours of direct sunlight in mid-winter, significantly reducing requirement for mechanical heating.

To further enhance thermal performance, double glazing proposed to all windows, with thermally broken frames.

3.3 Natural Ventilation and Coastal Wind mitigation

At least 60% of apartments must have natural cross ventilation. The development leverages its coastal position by incorporating dual-aspect layouts and strategically placed openings to meet this requirement set by SPP 7.3.

Strategy includes wind-buffered balconies and high-performance joinery to allow for effective cross-ventilation even during high-velocity afternoon sea breezes.

3.4 Integrated renewable energy systems

A significant Rooftop Solar PV array is intended for integration into the roof plant architecture. The system is proposed to utilize an **integrated energy distribution strategy** (such as a shared solar distribution platform) to provide renewable energy to both common area services – including basement ventilation, lift operations, and lobby lighting – and individual residential dwellings.

By diversifying the solar offset across the entire development, the strategy aims to maximise on-site renewable consumption and support residential energy performance targets, transitioning the building towards a Net Zero Operational Carbon pathway. The final system configuration, capacity, and distribution model remain subject to detailed electrical engineering and Client preference regarding the preferred metering and commercial strategy.

3.5 Integrated Ground-plane & Deep soil Landscaping Strategy

In response to the dual-level basement footprint, the development adopts a robust, multi-layered ground-plane landscaping strategy that prioritizes high-impact interface planting over traditional rooftop gardens. The approach focuses on:

- **Perimeter and Entry landscaping:** Significant soft-scaped buffers are provisioned along the primary site boundaries and the main building entrance. These zones leverage advanced ‘planting on structure’ design standards with engineered soil depths capable of supporting small-to-medium structural trees and a diverse understorey of native coastal species, creating an immediate localized cooling effect at the pedestrian interface.
- **Boundary Screening and architectural interface:** In lieu of upper-level planters, vertical softening is achieved through intensive perimeter boundary planting. Strategic climbing species and dense peripheral shrubbery are deployed to drape over boundary interfaces, naturally integrating the lower levels of the building fabric into the surrounding landscape while enhancing ground-level occupant privacy.
- **Public Realm Enhancement:** The project incorporates the installation of additional substantial canopy trees both within the adjoining public open space and directly along the lot boundaries. While partially external to the immediate lot boundaries, these trees provide a crucial contribution to the local Jindalee precinct’s cumulative canopy cover, actively mitigating the urban heat island effect for both residents and the wider community.

3.6 Coastal material resilience and Lifecycle sustainability

Located within a high-corrosion coastal zone, the project will specify materials for extreme longevity. This is critical for ground-level and perimeter elements exposed to salt spray and high traffic. The use of 316-grade stainless steel, salt-tolerant concrete mixes, and high-performance coatings will reduce the lifecycle environmental impact by extending maintenance cycles and preventing premature material replacement.

3.7 High performance Material palette and Circularity

The selection of materials has been curated to balance coastal aesthetic with long-term environmental durability. Key elements include:

- **Timber-look cladding and battens:** provides the warmth of natural wood without the high maintenance and resource-intensive replacement cycles usually required in high-salinity environments.
- **Low-maintenance envelopes:** The use of Aluminium-framed porticos and rendered Harditex lining (white painted) ensures a high-reflectivity finish (reducing solar heat gain) and superior resistance to coastal corrosion.

- Glazing and Transparency: Glass balustrades are utilized to maximise natural light penetration into the living spaces, reducing the need for artificial lighting, while maintaining unobstructed views that celebrate the Jindalee coastal context.
- A commitment to purchase and the design of internal fixtures to have the durability to ensure lifespan of 10+ years.

3.8 All electric building strategy

The development is proposed as a 100% all-electric building, eliminating gas reticulation entirely.

By utilizing induction cooktops and high-efficiency Heat Pump Hot Water systems, the project ensures a healthier indoor environment (no combustion by-products) and allows the building to be powered entirely by renewable energy as the grid continues to decarbonise.

3.9 Water Sensitive Urban Design & Irrigation strategy

In alignment with the City of Wanneroo's Waterwise Council status, the project incorporates on-site stormwater management to support its extensive ground-level landscaping. Stormwater is captured and filtered through permeable paving and garden beds before being utilized for a smart, sensor-based irrigation system. This ensures the survival of perimeter and balcony plantings during Jindalee's dry summer months while minimizing reliance on the local scheme water supply.

Further, the following water efficient initiatives that exceed current minimum practice have been committed to in the development:

- All fixtures to be within one star of the following WELS rating:
 - Taps: 6 Star
 - Urinals: 6 Star
 - Toilet: 5 Star
 - Showers: 3 Star (> 4.5 but <= 6.0)
 - Clothes Washing Machines: 5 Star
 - Dishwashers: 6 Star
- Local coastal species to be planted to minimize irrigation requirements.

3.10 Sustainable Transport and Pedestrian Connectivity

The development encourages low-carbon transit by prioritizing pedestrian access and cycling infrastructure at the ground level.

To compensate for the basement parking requirement, the project provides high-quality 'End-of-Trip' facilities and secure bicycle storage located conveniently near the main entrance. Furthermore, the basement levels will be 100% EV-ready, with pre-cabled infrastructure to support the transition to electric mobility.

3.11 Waste minimization & management

The building incorporates a dedicated, appropriately sized waste and resource storage enclosure. Safe and efficient access to all waste and resource storage areas is guaranteed for both building occupants and waste collection contractors.

An integrated operational Waste Management Plan (WMP) will be developed to prioritise resource recovery across the lifecycle of the project. In lieu of internal vertical chuting, collection workflows are supported by a dedicated on-

street garbage truck embayment, ensuring seamless roadside servicing without disrupting local traffic flows. The development also provides designated space for 'hard waste' storage and organic composting streams, targeting a minimum 75% diversion-from-landfill benchmark during building operations.

3.12 Social sustainability & Community benefit:

Recognising the project's interface with the adjacent Public open space, the sustainability strategy includes a voluntary commitment to enhance public realm. By planting additional trees within the adjoining Public Open space & along the boundary line, the development provides a tangible 'Community benefit' through increased precinct canopy cover. This fosters social sustainability by improving the microclimate and aesthetic quality of the shared public environment for both residents and neighbours.

3.13 Indoor Environmental Quality

- To ensure a healthy and comfortable indoor environment, outdoor pollutants are mitigated; the ventilation system will be designed for ease of maintenance and cleaning; and the system will be cleaned prior to occupation and use.
- Sufficient outdoor air to ensure levels of indoor pollutants are maintained at acceptable levels.
- Commitment to ensure at least 95% of all internally applied paints, adhesives, sealants and carpets meet stipulated 'Total VOC Limits'.
- Either no engineered wood products are used, or at least 95% of all engineered wood products used meet stipulated formaldehyde limits as per limits in Appendix A, B, and C.
- The design ensures high levels of daylighting to all habitable rooms and utilizes acoustic dampening measures to protect the internal 'acoustic amenity' from coastal wind noise and surrounding activity.

3.14 Passive Solar Design

The development incorporates passive solar design principles, ensuring optimal solar and daylight access, natural ventilation, effective shading, and the use of thermal mass for passive heating and cooling.

3.14.1 Solar & Daylight Access

The development has been designed to optimise solar and daylight access:

- All habitable rooms have significant windows allowing daylight access.
- Minimising the amount of obscure glazing & West-facing glazing.
- Natural light penetrating to interior corridors and to the building's perimeter, reducing reliance on artificial lighting during daylight hours.
- Wherever possible, northern light has been prioritised to maximise winter solar gain, supporting passive heating, and allowing for comfortable, seasonally responsive living environments.

3.14.2 Natural Ventilation

At least 60% of apartments have effective natural cross ventilation.

3.14.3 Shading

Effective shading from the summer sun has been achieved in the development through:

- **Customizable Façade Screening:** The building utilizes operable, sliding timber-look batten screens on the façade. This provides residents with fully customizable shading options, enabling dynamic protection from the harsh western coastal sun in summer while still preserving valuable solar ingress during winter.

3.14.4 Thermal Mass

The design has integrated concrete floors to harness thermal mass for passive heating and cooling.

3.15 Connection to nature

- **Integrated Landscape strategy:** Public and private landscaping are core to the proposal. The north-facing landscaped area follows the site's natural slope, utilizing native planting and tiered elements to provide high-quality visual and practical amenity for both residents and public.
- **Expanded private greenery:** All apartments feature extensive balconies that exceed R-Code minimums. These include architectural batten screens, integrating natural shading and localized microclimate controls to provide a private, direct connection to the outdoors on every level.
- **Optimized solar amenity:** The northern orientation of the common landscaped areas ensures these spaces remain high-amenity zones year-round. By maximising winter sun, the design provides thermal comfort and usable outdoor space in all seasons.
- **Precinct Connectivity:** The proposal integrates seamlessly with the surrounding context through a physical link to the southern landscaped stairs. This creates a fluid transition between site levels and enhances pedestrian permeability.

4 CONCLUSION

In summary, the sustainability measures detailed in this report allow Lot 9052 (#500K) Maritime Drive, Jindalee WA 6036 to surpass 'business as usual' energy efficiency benchmarks and minimum requirements of the National Construction Code. The design not only responds to the surrounding environment but also ensures a high standard of sustainability and energy efficiency, leading to a building with a positive environmental footprint.

We are confident that these measures will contribute to a greener and more sustainable future for the proposal and set a commendable example for future developments in the area.

5 APPENDICES

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

Product Category	Max TVOC content in grams per litre (g/L) of ready to use product.
General purpose adhesives and sealants	50
Interior wall and ceiling paint, all sheen levels	16
Trim, varnishes and wood stains	75
Primers, sealers and prep coats	65
One and two pack performance coatings for floors	140
Acoustic sealants, architectural sealant, waterproofing membranes and sealant, fire retardant sealants and adhesives	250
Structural glazing adhesive, wood flooring and laminate adhesives and sealants	100

Appendix B: Carpet Test Standards and TVOC Emissions Limits

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

*Both limits should be met when testing against ASTM D5116

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

Test Protocol	Emission Limit/Unit of Measurement
AS/NZS 2269:2004, testing procedure AS/NZS 2098.11:2005 method 10 for Plywood	≤1mg/ L
AS/NZS 1859.1:2004 - Particle Board, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1.5 mg/L
AS/NZS 1859.2:2004 - MDF, with use of testing procedure AS/NZS 4266.16:2004 method 16	≤1mg/ L
AS/NZS 4357.4 - Laminated Veneer Lumber (LVL)	≤1mg/ L
Japanese Agricultural Standard MAFF Notification No.701 Appendix Clause 3 (11) - LVL	≤1mg/ L
JIS A 5908:2003- Particle Board and Plywood, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A 5905:2003 - MDF, with use of testing procedure JIS A 1460	≤1mg/ L
JIS A1901 (not applicable to Plywood, applicable to high pressure laminates and compact laminates)	≤0.1 mg/m ² hr

ASTM D5116 (applicable to high pressure laminates and compact laminates)	$\leq 0.1 \text{ mg/m}^2\text{hr}$
ISO 16000 part 9, 10 and 11 (also known as EN 13419), applicable to high pressure laminates and compact laminates	$\leq 0.1 \text{ mg/m}^2\text{hr}$ (at 3 days)
ASTM D6007	$\leq 0.12 \text{ mg/m}^3$ **
ASTM E1333	$\leq 0.12 \text{ mg/m}^3$ ***
EN 717-1 (also known as DIN EN 717-1)	$\leq 0.12 \text{ mg/m}^3$
EN 717-1 (also known as DIN EN 717-2)	$\leq 0.12 \text{ mg/m}^3$

*mg/m²hr may also be represented as mg/m²/hr.

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

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