

TOWNHOUSES
11 Chetwynd Way Booragoon - DA



SUSTAINABLE DESIGN
STRATEGY

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CONFIDENTIALITY

The contents of the report are confidential. This report is for the purpose of initial design advice related to sustainable considerations of the project. All included information and documentation shall remain the property of CADDs Group therefore shall not be replicated in any form without written consent from CADDs Group.

DISCLAIMER

The intent of the Sustainable design strategy is to demonstrate targets can be achieved based on further discussions with service consultants, an update of performance modelling and a cost/benefit analysis of all items for consideration. It is not the intent of the strategy to provide certainty of credits instead identify sustainable opportunities that may be integrated in the design. The integrated approach allows for multiple members of the design team to work together for a common goal to maximise efficiencies. The approach will increase flexibility in design, save money and provide higher performing buildings than traditional approach.

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1 OVERVIEW

CADDs Group has developed a sustainable strategy on the proposed townhouse development at 11 Chetwynd Way Booragoon in consultation with Rechitects Architecture and Design.

The purpose of this report is to support the development application by identifying the principles incorporated in the design that meet sustainable objectives and targets for the site.

The review and recommendations are based on experience of sustainable practices an understanding of functionality, a review of current project documentation and an analysis of the site. The initial assessment is based on preliminary documentation with the outcomes subject to change during design development.

1.1 FINDINGS

CADDs has undertaken a review of the current site, building layout and sustainable initiatives for inclusion within the project and provided achievable targets for the development.

Table 1 Sustainability Initiatives

Category	Target	Comment
Energy Efficiency	50% Reduction in GWP compared BAU	Average 7 Star NatHERS Rating. Provision of solar PV array (5kW PV/townhouse) Metering and monitoring. Efficient hot water (ie Solar or Heat Pump)
Water Efficiency	50% reduction in water use compared to BAU	Provision of water efficient appliances and equipment.
Health and Wellbeing	Low exposure to pollutants	Selection of low VOC finishes
	40% of the nominated floor area has been designed to high levels of daylight during hours of occupancy	Use of Glass with low SHGC but high VLT, to allow reduction of solar while maintaining daylight.
Transport	Reduction in car use	Bicycle storage in garage

The proposed townhouses are designed to exceed the minimum requirement of the NCC by reducing its heating and cooling through the use of various strategies.

Table 2 NatHERS Benchmark

Unit	Cooling	Heating	Total	Base Star Rating	Solution	
	Mj/m2				Cavity Wall insulation	Low-E Neutral
1	23.8	14.9	38.7	7.8	N/A	N/A
2 – 6	16.1	21.6	37.7	7.8	N/A	N/A
7	26.3	12.6	38.9	7.8	N/A	N/A
8	66.8	26.8	93.6	4.8	5.7	6.4
9	55.2	40.1	95.3	4.8	5.7	6.8
10	54.2	49.3	103.5	4.4	5.2	6.5
11	34.2	41.8	76	5.7	7.7	N/A
12-13	38.9	41.7	80.6	5.4	6.7	N/A

A Life Cycle target setting has been undertaken. The primary purpose of the Target Setting is to set performance based environmental targets can then be set for the project. These targets form part of the project brief and commitment by the developer to support the DA.

Table 3 LCA Outcome

Strategy Description	GWP Saving	FW Saving
Base Design performance compared to benchmark (e.g. density, yield, occupancy, design life, reduced outdoor water use)	9.02%	19.40%
Lighting: High Efficiency LED Lights	1.98%	0.04%
Improved thermal performance (6 to 8 stars)	1.18%	0.02%
Energy Monitoring: Residential, Basic	5.30%	0.10%
Efficient Water Appliances	0.59%	33.60%
Solar PV (High Efficiency Panels)	47.0%	6.45%
Total	65.0%	60%

2 HEALTH AND WELLBEING

Through the enhancement of indoor environment quality, occupants will see improvements to health along with benefits to thermal comfort resulting in a more inviting and liveable internal environment.

Ample external views have been provided to residences through the utilisation of dedicated solar passive design principles.

A high performing building façade with low-e glazing for the project will assist with providing comfortable conditions.

2.1 THERMAL COMFORT

Based on preliminary modelling townhouse types with an east and west facing façade (8,9, 10) typically have high cooling loads with low amounts of shading. It is recommended that high performance glass is specified to achieve a more comfortable outcome for these dwellings as per detailed below.

Table 4 NatHERS Rating

Apartment	Cooling (Mj/m ²)	Heating (Mj/m ²)	Star Rating	% Improvement over minimum **
1	23.8	14.9	7.8	44.71%
2 – 6	16.1	21.6	7.8	46.14%
7	26.3	12.6	7.8	44.43%
8	45.4	15.8	6.4	12.57%
9	38.1	17.7	6.8	20.29%
10	33.9	27	6.5	13.00%
11	24.7	15.2	7.7	43.00%
12-13	25.2	32.8	6.7	17.14%

**Percentage improvement is the % reduction in the total heating and cooling load against an NCC compliant building.

2.1.1 Cavity Wall Insulation

Improve wall resistance to heat flow through the use of cavity wall insulation. Cavity wall insulation to be installed to all exposed brick cavity walls.

Table 5 Cavity Wall upgrade

Wall systems	Heat Flow In (Summer)	Heat Flow Out (Winter)
Double brick cavity wall	R _T 1.9	R _T 1.8

2.1.2 Glazing Upgrades

Reduce solar gains through east and west facing window through the use of applied low-e films.

Table 6 Glazing upgrades

Total window system	Uw	SHGCw
Low-e glass in aluminium frame	4.3	0.48

3 ENERGY EFFICIENCY

A key concern with new buildings is greenhouse gas emissions, making up approximately 20% of total GHG emissions in Australia. A number of initiatives and various technology will be incorporated with in the project to ensure these are mitigated.

A crucial aspect will be minimising energy usage. A 50% reduction in GHG emissions will be targeted.

This will be achieved through the following strategies:

- 7 Star Average NatHERS rating
- Metering and Monitoring.
- Provision of 5kW PV per townhouse
- High efficiency LED lights

4 WATER EFFICIENCY

Perth has a limited potable water supply due to the increases in population and reductions in rainfall levels. By reducing this demand will help to alleviate the concerns related to potable water usage. All new water services are to ensure that high WELS rating fixtures and fitting are to be installed as appropriate.

Table 4 WELS Ratings

Fixture / Equipment Type	WELS Rating
Taps	5 Star
Toilets	4 Star
Showers	4 Star (not more than 7.5L/m)

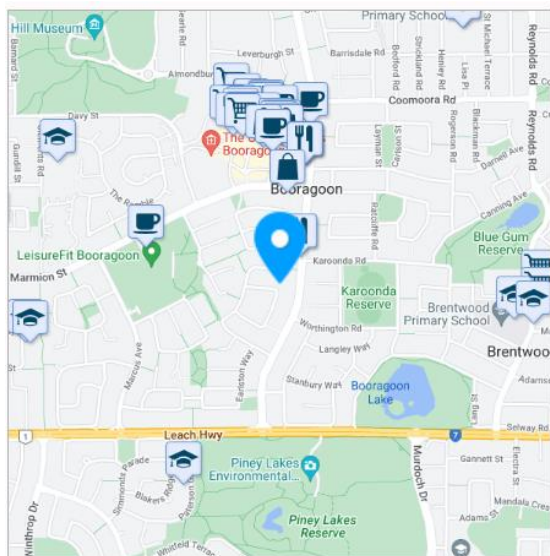
5 TRANSPORT

The location of this development in City of Melville is accessible by walking, cycling, and public transport (bus) options are available.

It is the intention of this category to reduce occupant’s dependency on private vehicle usage. This is achieved by providing alternatives methods of transport and provide a high level of amenity in the surrounding vicinity.

The location is walkable by walk score where most errands can be accomplished by foot.

The location is close to bus stations including (501 & 500) that run along Riseley street to and from Bull creek station to surrounding suburbs



6 INDUSTRY BENCHMARKS

The building has been designed to National Construction Code Energy Efficiency requirements and Design WA.

6.1 NCC

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 National Construction Code (NCC) requires a minimum of a 6 Star NatHERS

The proposed development is designed to exceed the minimum requirement of the NCC by reducing its heating and cooling requirement as per table 6 above

6.2 LIFE CYCLE ASSESSMENT (LCA) TARGET SETTING

The target setting service is a very early stage LCA study with the goal of determining the feasibility of various design options and deciding the performance target for a development. The target setting service is designed for very early-stage developments without any more information than a design brief and significant assumptions need to be made to study the life cycle impacts of design options. The study confirms the design team has thoroughly considered the life cycle design performance of the development and has shortlisted strategies that will enable the stated performance target to be met. To prove that the target has been met with the final design, a comprehensive Life Cycle Assessment must be conducted in compliance with EN15978.

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Total	65.0%	60%

