

# SUSTAINABLE MANAGEMENT PLAN

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PROPOSED MIXED-USE  
DEVELOPMENT

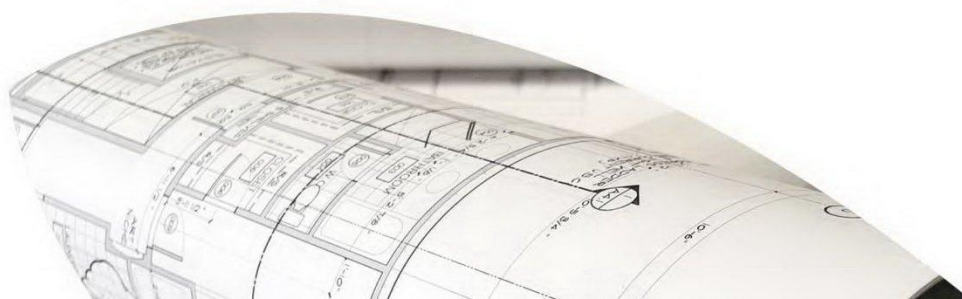
1041 Centre Road,  
Oakleigh South

GIW20113  
Revision C

Prepared for:  
Pellicano

27 July 2021

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## Revision History

Revision Number	Date Issued	Author	Approved	Comments
A	14/07/2021	IB	GW	Draft
B	22/07/2021	IB	GW	Final
C	27/07/2021	IB	GW	Final

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# 1. Introduction

## Project Information

GIW Environmental Solutions Pty Ltd ("GIW") has been engaged by Pellicano to provide Environmentally Sustainable Design (ESD) consulting services for the proposed mixed use development at 1041 Centre Road, Oakleigh South.

The proposed development will include 173 apartments, 10 retail tenancies, 1 café and a supermarket constructed over 8 levels plus basement carpark and outdoor carpark and will consist of the following:

- 7 x studio apartments
- 112 x 1 bedroom apartments
- 54 x 2 bedroom apartments
- 787.3m<sup>2</sup> retail
- 134.5m<sup>2</sup> café
- 1,919.5m<sup>2</sup> supermarket

The site located at 1041 Centre Road, Oakleigh South has an approximate surface area of 9,597m<sup>2</sup> and is currently the location of a commercial building and outdoor carpark. Distance from the site to Melbourne CBD is approximately 18km.

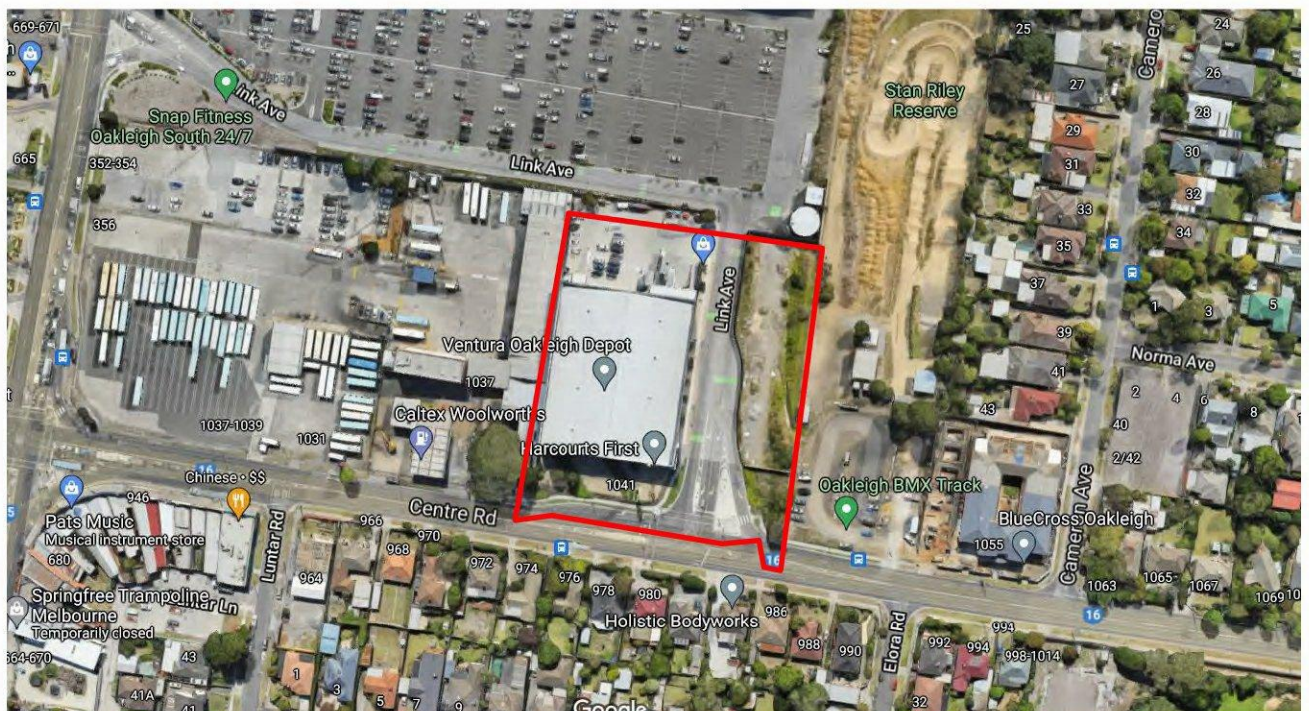


Figure 1 - Pre-existing sites at 1041 Centre Road, Oakleigh South.

## Statutory Requirements

This Sustainable Management Plan (SMP) has been prepared to inform City of Monash of the proposed development's sustainability credentials and performance targets. The project team is committed to achieving a building solution which responds to City of Monash Planning Scheme - Clause 22.13 Environmentally Sustainable Development Policy.

Development Type	Application Requirement	Example Tools
<ul style="list-style-type: none"> <li>Development of 10 or more dwellings.</li> </ul>	Sustainability Management Plan (SMP)	BESS Green Star MUSIC STORM

## Built Environment Sustainability Scorecard (BESS)

The proposed mixed-use development will be assessed against the Built Environment Sustainability Scorecard (BESS) guidelines. The BESS tool addresses nine key environmental categories as follows:



Figure 2 - BESS Environmental Categories ([www.bess.net.au](http://www.bess.net.au))

All ESD measures described under the nine key environmental categories are to be suitably incorporated into relevant project documentation at the appropriate project phase.

## Responsibilities & Implementation

Pellicano will be responsible for the suitable implementation of the requirements of this report throughout the design and development phases. Should the development be sold the responsibility will pass to the new owner. At such time as a builder is novated or a building contract is put in place the builder will be responsible for implementation during the construction phase. At occupancy, the Owners Corporation and individual lot owners and or tenants will be responsible for the correct use of installed equipment and building systems in line with the provided Building User's Guide.

## Sources of Information

The following 'Sources of Information' have been used to guide the design solutions:

- i2C Architects– Project No. 2020-506 – Drawing No. DA10-DA13 Rev TP0; DA30-DA37 Rev TP0; DA40-D44 Rev TP0; DA50-DA51 Rev TP0; DA60-DA63 Rev TP0; DA70-DA74 Rev TP0.
- Municipal Association of Victoria - SDAPP Explained; Building Design for a Sustainable Future
- Built Environment Sustainability Scorecard (BESS)
- CSIRO 1999, Urban Stormwater – Best Practise Environmental Management Guidelines

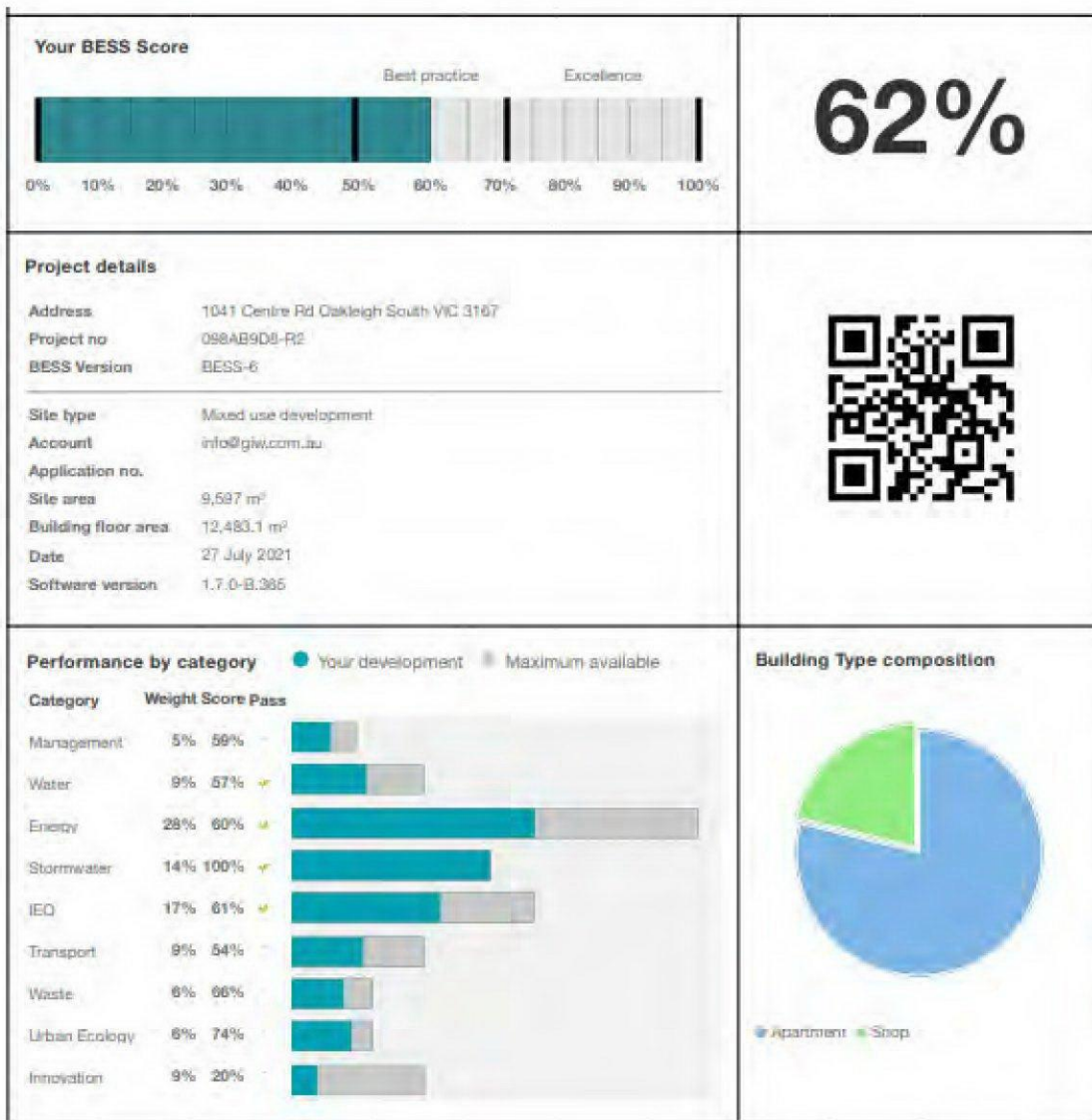
## 2. ESD Summary

The proposed mixed-use development at 1041 Centre Road, Oakleigh South will implement the following ESD initiatives:

1. The project achieves a total BESS score of 62% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%.
2. 40% (70 out of 173) of the development's apartments are naturally cross-ventilated.
3. The BESS Built-in Daylight Calculator has been used to demonstrate compliance.
4. The non-residential areas are targeting a 2% DF to 33% of the nominated area.
5. 44% (76 out of 173) of apartments achieve at least 3 hours of sunlight.
6. The development is provided with a comprehensive shading strategy
7. The development is to achieve a 7.0 Star average NatHERS Energy Rating result.
8. The non-residential areas aim to reduce heating and cooling energy consumption below the reference case (BCA Section J 2019).
9. The development is to utilise a centralised gas hot water system
10. A 100kW Solar PV system is to be located on the roof of the proposed development.
11. Individual cold and hot water, electricity meters will be provided to the apartments and communal areas.
12. Water efficient fittings and fixtures are applied throughout.
13. A 30,000 litre rainwater tank will harvest rainwater from the upper roof. This tank will be connected to all commercial drawings.
14. A Melbourne STORM rating of 103% is achieved.
15. The majority of landscaping is to be native vegetation and water efficient drip irrigation will be provided.
16. In total 174 bicycle spaces and a bicycle workshop are to be provided for residents.
17. In total 20 bicycle spaces are to be provided for residential visitors.
18. 18 bicycle spaces are to be provided for non-residential visitors.
19. The development is provided with an end of trip facility including 1 shower, 8 lockers and changing facilities.
20. 2,210m<sup>2</sup> of communal space will be provided at level 1 podium and roof.
21. The communal food production area will be provided at level 1 podium.

### 3. BESS Performance

The project achieves a total BESS score of 62% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%. This figure represents a percentage improvement over a benchmark project. A score of 50% and higher equates to 'best practice' and is an effective pass of the BESS tool. A score of 70% and higher equates to BESS 'excellence' and exists as a higher benchmark in the tool.





## 4. ESD Assessment

### Management

Council ESD objectives:

- To encourage a holistic and integrated design and construction process and ongoing high performance.

### Council Best Practice Standard




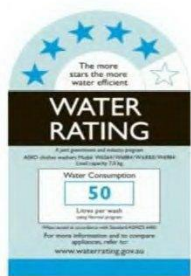
Criteria	Construction and Building Management Actions	
Pre-Application Meeting	To ensure appropriate sustainable design principles and strategies are considered from the preliminary design stage of each development.	GIW has been actively involved in the preliminary design stage, but has not been involved in a pre-application meeting with Council.
Metering	To provide building users with information that allows monitoring of energy and water consumption	Electricity, cold water, hot water or gas metering is to be provided to each individual apartment and commercial tenancy. Lighting and general power to common areas is to be separately metered to quantify energy used for common areas spaces.
Building User's Guide	To encourage and recognise initiatives that will help building users to use the building more efficiently.	A Building User's Guide will be provided to all occupants explaining the correct use of installed equipment and building systems. This shall cover at a minimum: <ul style="list-style-type: none"> <li>• Energy and Environmental Strategy</li> <li>• Options for purchasing a ≥3 Star Washing Machine</li> <li>• Monitoring and Targeting</li> <li>• Building Services</li> <li>• Transport Facilities</li> <li>• Materials and Waste Policy</li> <li>• Expansion/Re-fit Considerations</li> <li>• References and Further Information</li> </ul>

**Water**

Council ESD objectives:

- To ensure the efficient use of water
- To reduce total operating potable water use
- To encourage the collection and reuse of stormwater
- To encourage the appropriate use of alternative water sources (e.g. grey water)
- To minimize associated water costs

**Council Best Practice Standard**

Criteria	Development Provision				
Potable Water Reduction	To reduce total potable water use due through the use of efficient fixtures, appliances, and the use of rainwater.	WELS 4 Star - Toilets	WELS 5 Star - Taps	WELS 4 Star - Showerhead	WELS 5 Star - Dishwasher
					
Rainwater Collection & Reuse		<p>A 30,000 litre rainwater tank will harvest rainwater from the upper roof. This tank will be connected to all commercial drawings. It is estimated that this will save more than 371kL of potable water every year and meet 73% of the demand in these areas.</p> <p>Stormwater drainage mechanism is to be determined by the hydraulics services engineer at the design development phase.</p> <p>Refer Appendix A – WSUD Response</p>			
Landscape Irrigation	To ensure the efficient use of water and to reduce total operating potable water use through encouraging water efficient landscape design.	The majority of landscaping is to be native vegetation and water efficient drip irrigation will be provided.			

### Council Best Practice Standard

Criteria	Development Provision
Building System Water Use Reduction	<p>Ensure the efficient use of water, to reduce total operating potable water use and to encourage the appropriate use of alternative water sources for cooling and fire testing systems.</p> <p>&gt;80% of fire test water is to be reused on site. Sprinkler drain downs are to be connected to the rainwater tank and reused for toilet flushing.</p> <p>The proposed development is to incorporate air-cooled HVAC systems for both the residential and non-residential areas within the development.</p>

## Energy

Council ESD objectives:

- To ensure the efficient use of energy
- To reduce total operating greenhouse emissions
- To reduce energy peak demand
- To reduce associated energy costs

### Council Best Practice Standard

Criteria	Development Provision																																										
	<p>The National Construction Code (NCC) Class 2 – Sole Occupancy Unit(s) residential building component is to be designed in accordance with NCC Section J (2019) NatHERS requirements. The residential units must achieve an average 7.0 Star rating, with no unit achieving below 5 Stars.</p> <p>Further to this no dwelling is to exceed the maximum allowed cooling load of 21 MJ/m<sup>2</sup> (Climate Zone 62 Moorabbin) In accordance with BADS Standard B35.</p> <p>The apartments are currently achieving a 7.4 Star average. This represents &gt; 10% reduction compared to minimum NCC compliance benchmarks. The below sample ratings demonstrate the developments ability to achieve this average. Refer Appendix B for Preliminary FirstRate Certificates.</p>																																										
Thermal Performance Rating - Residential  To reduce energy needed to achieve thermal comfort in summer and winter - improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.	<table border="1"> <thead> <tr> <th>Apartment No.</th> <th>ACE Total MJ/M2</th> <th>ACE Heating</th> <th>ACE Cooling</th> <th>ACE NCFA</th> <th>Star Rating</th> </tr> </thead> <tbody> <tr> <td>2.18</td> <td>59.1</td> <td>43.9</td> <td>15.2</td> <td>43.2</td> <td>7.9</td> </tr> <tr> <td>3.14</td> <td>102.9</td> <td>82.7</td> <td>20.2</td> <td>55.4</td> <td>6.6</td> </tr> <tr> <td>5.25</td> <td>87.5</td> <td>71.3</td> <td>16.2</td> <td>65.2</td> <td>7.1</td> </tr> <tr> <td>4.01</td> <td>48.4</td> <td>37</td> <td>11.4</td> <td>74.1</td> <td>8.3</td> </tr> <tr> <td>6.06</td> <td>95.4</td> <td>76.9</td> <td>18.5</td> <td>35.8</td> <td>6.9</td> </tr> <tr> <td><b>Average</b></td> <td><b>78.7</b></td> <td><b>62.4</b></td> <td><b>16.3</b></td> <td><b>54.7</b></td> <td><b>7.4</b></td> </tr> </tbody> </table> <p>*Apartments are assessed using FirstRate5 v5.3.1a</p> <p>Construction assumptions for preliminary FirstRate ratings are listed below. Note, these assumptions are based on the sample of apartments assessed and may vary throughout the development. These assumptions are not to be relied upon for any other purpose beyond Town Planning assessment.</p>	Apartment No.	ACE Total MJ/M2	ACE Heating	ACE Cooling	ACE NCFA	Star Rating	2.18	59.1	43.9	15.2	43.2	7.9	3.14	102.9	82.7	20.2	55.4	6.6	5.25	87.5	71.3	16.2	65.2	7.1	4.01	48.4	37	11.4	74.1	8.3	6.06	95.4	76.9	18.5	35.8	6.9	<b>Average</b>	<b>78.7</b>	<b>62.4</b>	<b>16.3</b>	<b>54.7</b>	<b>7.4</b>
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**Council Best Practice Standard**

Criteria	Development Provision		
	Element	Material	Insulation Value
	Floor	Concrete	TBC
	External Walls	Heavyweight	R1.8
	External Walls	Lightweight	R2.5
	Internal Walls	Heavyweight	R1.8
	Internal Walls	Lightweight	R2.5
	Roof	Concrete	TBC
	Fixed Windows	Aluminium framed, Double glazed, Argon filled, Low-E, Clear	Total System: • U-value: 2.71 • SHGC: 0.58
	Sliding Doors	Aluminium framed, Double glazed, Argon filled, Low-E, Clear	Total System: • U-value: 3.19 • SHGC: 0.48
	Awning Windows	Aluminium framed, Double glazed, Argon filled, Low-E, Clear	Total System: • U-value: 4.42 • SHGC: 0.41
Thermal Performance Rating – Non-Residential	To reduce energy needed to achieve thermal comfort in summer and winter - improving comfort, reducing greenhouse gas emissions, energy consumption, and maintenance costs.	The non-residential areas aim to reduce heating and cooling energy consumption below the reference case (BCA Section J 2019).	
Peak Energy Demand	To reduce demand on electrical infrastructure	A high-performance thermal envelope in conjunction with high efficiency HVAC systems and lighting systems reduce energy demand at peak times.	

### Council Best Practice Standard

Criteria	Development Provision	
	during peak cooling periods.	
HVAC System	To ensure the efficient use of energy and to reduce consumption of electricity.	<p>Inverter split systems are to be installed and sized to maintain conditions of the main living space of each apartment. The efficiency of the air conditioning system is to be within 1 star rating of best available under MEPS Post-October 2012 measurement standard.</p> <p>VRV / VRF systems with a COP of 3.4 are to be installed to the non-residential areas.</p>
Hot Water System	To ensure the efficient use of energy and to reduce consumption and greenhouse emissions from water heating.	<p>The development is to utilise a centralised gas hot water system, with either:</p> <ul style="list-style-type: none"> <li>• 6 Star energy rating for instantaneous units; or</li> <li>• Minimum 85% energy efficiency for a single water heater</li> </ul>
Car Park Ventilation	To ensure the efficient use of energy, reduce total operating greenhouse gas emissions and to reduce energy peak demand.	<p>Carpark ventilation fans are driven by a VSD motor connected to CO sensors within the carpark. The inclusion of CO sensor control will allow the ventilation fans to ramp down when the car park is unoccupied. The system is to be designed in accordance with AS1668.2.</p> <p>The mechanical services engineer is responsible for the design and specification of the system. The contractor is to procure and install the specified system.</p> <p>Maintenance requirements of the CO sensor system are to be included in the O&amp;M manual.</p>
Clothes Drying	Ensure the efficient use of energy and to reduce energy consumption and greenhouse emissions associated with clothes drying	NIL

**Council Best Practice Standard**

Criteria	Development Provision
Internal Lighting - Residential	<p>To ensure the efficient use of energy, to reduce energy consumption, greenhouse emissions associated with artificial lighting, and to reduce energy peak demand.</p> <p>The maximum illumination power density (W/sqm) is at least 20% lower than NCC 2019 requirements.</p> <p>Lighting power density shall be as follows:</p> <ul style="list-style-type: none"> <li>• Dwellings: No greater than average 4W/m<sup>2</sup></li> <li>• POS: No greater than average 4W/m<sup>2</sup></li> <li>• Back of house and indoor car parks: No greater than average 5W/m<sup>2</sup></li> </ul> <p>All common area, external and carpark lighting is to be controlled with daylight, motion sensors or timers (whichever is deemed appropriate).</p>
Internal Lighting – Non-Residential	<p>To ensure the efficient use of energy, to reduce energy consumption, greenhouse emissions associated with artificial lighting, and to reduce energy peak demand.</p> <p>The maximum illumination power density (W/m<sup>2</sup>) in the non-residential areas meets the requirements of Table J6.2a of the NCC 2019 Section J.</p> <p>Lighting power density shall be as follows:</p> <ul style="list-style-type: none"> <li>• Retail: No greater than average 14W/m<sup>2</sup></li> <li>• Office: No greater than average 4.5W/m<sup>2</sup></li> </ul>
Renewable Energy Systems - Solar	<p>To encourage on-site renewable energy generation and reduce greenhouse emissions.</p> <p>A 100kW Solar PV system is to be located on the roof of the proposed development. The system is expected to generate approximately 144,162kWh and will be connected to an embedded network serving the development.</p> <p>Future spatial provision for battery storage will be incorporated into the design.</p>



Location Solar PV System

Refer Appendix C – Renewable Energy

## Stormwater

Council ESD objectives:

- To reduce the impact of stormwater run-off
- To improve the water quality of stormwater run-off
- To achieve best practice stormwater quality outcomes
- To incorporate water sensitive urban design principles

### Council Best Practice Standard

Criteria	Development Provision
Stormwater Treatment  To minimise negative environmental impacts of stormwater runoff and maximise onsite re-use of stormwater.	<p>The Melbourne Water - Stormwater Treatment Objective Relative Measure (STORM) tool has been applied to determine performance relative to Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999). As per City of Monash Planning Scheme - Clause 53.18 Stormwater Management in Urban Development, the development is required to achieve a STORM rating of 100% or greater.</p> <p>A Melbourne STORM rating of 103% is achieved via the following:</p> <ul style="list-style-type: none"> <li>• Rainwater is to be collected from the roof areas and directed into the 30,000 litre rainwater tank. All commercial WC's are to be connected to the rainwater tank.</li> <li>• Rainwater is to be collected from level 1 podium and directed into a <math>\geq 44\text{m}^2</math>, minimum 950mm deep raingarden with 100mm of extended detention.</li> <li>• Rainwater is to be collected from the outdoor carpark and directed into a total <math>\geq 33\text{m}^2</math>, minimum 950mm deep raingardens with 100mm of extended detention.</li> </ul> <p>Refer Appendix A – WSUD Response.</p>



## Indoor Environment Quality


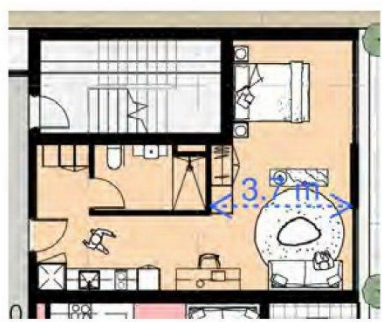
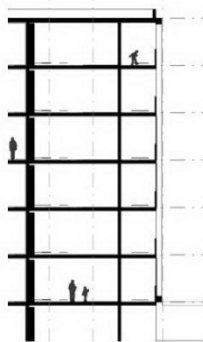
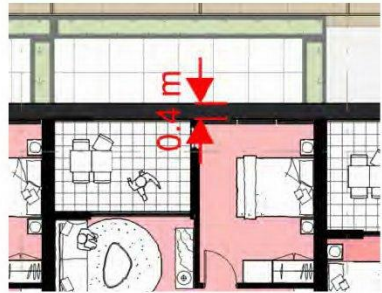
Council ESD objectives:

- to achieve a healthy indoor environment quality for the wellbeing of building occupants.
- to provide a naturally comfortable indoor environment will lower the need for building services, such as artificial lighting, mechanical ventilation and cooling and heating devices.

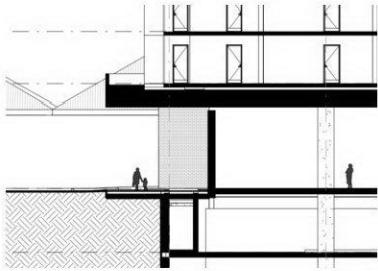
### Council Best Practice Standard

Criteria		Development Provision
Daylight Access - Residential	To provide a high level of amenity and energy efficiency through design for natural light.	The BESS Built-in Daylight Calculator has been used to demonstrate compliance.
Winter Sunlight	To provide a high level of amenity and reduce need for artificial heating in winter.	44% (76 out of 173) of apartments achieve at least 3 hours of sunlight.
Daylight Access – Non-Residential	To provide a high level of amenity and energy efficiency through design for natural light.	The non-residential areas are targeting a 2% DF to 33% of the nominated area.
Minimal Internal Bedrooms	90% of bedrooms have an external window.	NIL internal bedrooms.
Effective Natural Ventilation	To provide fresh air and passive cooling opportunities.	40% (70 out of 173) of the development's apartments are naturally cross-ventilated. Apartments are provided with windows on opposite or adjacent facades or are effective single sided ventilated.

Council Best Practice Standard

Criteria	Development Provision	
	 <p data-bbox="703 837 986 909">Typical natural cross-ventilated apartment</p>	 <p data-bbox="1142 837 1417 909">Typical single sided ventilated apartment</p>
Ventilation – Non-Residential	To provide fresh air and passive cooling opportunities.	<p>≥60% of the retail and café area is effectively naturally ventilated.</p> <p>Outdoor air rate for the supermarket is to be 50% increased compared to AS 1668:2012.</p> <p>This is to be included in the mechanical design and specifications.</p>
Thermal Comfort	To provide comfortable indoor spaces and reduce energy needed for heating and cooling.	<p>The development is provided with a comprehensive shading strategy:</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="740 1263 943 1603">  <p data-bbox="655 1630 1034 1839">Recessed north, west and east windows at level 1-7 are shaded by the overhanging balcony of the floor above and movable perforated shading screens.</p> </div> <div data-bbox="1086 1285 1469 1576">  <p data-bbox="1098 1630 1461 1771">North, west and east oriented perimeter windows at level 1-7 are shaded by a 400mm overhang.</p> </div> </div>
Thermal Comfort –	To provide comfortable	The development is provided with a comprehensive shading strategy:

**Council Best Practice Standard**

Criteria	Development Provision	
Non-Residential	indoor spaces and reduce energy needed for heating and cooling.	
		<p>The retail, café and supermarket are shaded by the overhanging slab on the floor above</p>
		<p>None of the regular use areas of the commercial areas are provided with ceiling fans.</p>
Air Quality – Non-Residential	<p>All paints and adhesives meet the maximum total indoor pollutant emission limits.</p>	<p>All internally applied paints adhesives and sealants are to have a low or ultra-low VOC content in line with Green Star Design &amp; As-Built V1.3 Credit 13.1.</p>
	<p>All carpet meets the maximum total indoor pollutant emission limits.</p>	<p>All internally applied carpets are to have a low VOC content in line with Green Star Design &amp; As-Built V1.3 Credit 13.1.</p>
	<p>All engineered wood meets the maximum total indoor pollutant emission limits.</p>	<p>All internally applied engineered wood products are to have low formaldehyde levels in line with Green Star Design &amp; As-Built V1.3 Credit 13.2.</p>

## Transport

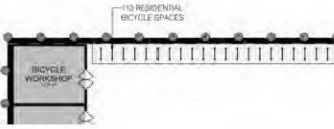
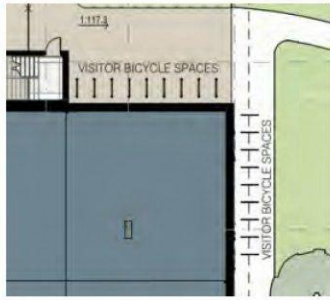
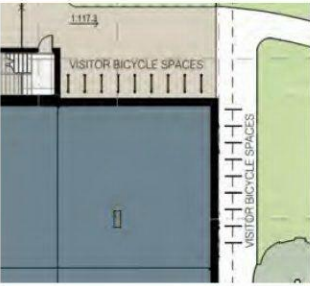
Council ESD objectives:

- To minimise car dependency.
- To ensure that the built environment is designed to promote the use of public transport, walking and cycling.


### Council Best Practice Standard

Criteria	Development Provision
<p>Bicycle Parking – Residential &amp; Residential Visitors</p>	<p>To encourage and recognise initiatives that facilitate cycling.</p>
<p>Bicycle Parking – Non-Residential &amp; Non-Residential Visitors</p>	<p>To encourage and recognise initiatives that facilitate cycling.</p>

	
<p>In total 174 bicycle spaces and a bicycle workshop are to be provided for residents. This will provide a ratio of approximately 1 resident bicycle space for every apartment.</p>	<p>In total 20 bicycle spaces are to be provided for residential visitors. This will provide a ratio of approximately 1 visitor bicycle space for every 9 apartments.</p>
	<p>In total 18 bicycle spaces are to be provided for non-residential visitors. This represents a 50% increase over the planning scheme requirements.</p>

### Council Best Practice Standard

Criteria	Development Provision	
End of Trip Facilities – Non-Residential	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	The development is provided with an end of trip facility including 1 shower, 8 lockers and changing facilities.
Electric Vehicle Infrastructure	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	One charging point for electrical vehicles is integrated in the proposed development.  
Car Share Scheme	To minimise car dependency and to ensure that the built environment is designed to promote the use of public transport, walking and cycling.	The proposed development will incorporate a dedicated car parking space for car sharing.
Motorbikes / Mopeds	To minimise car dependency and to ensure that the built environment is designed to promote the use of public	NIL

**Council Best Practice Standard**

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Criteria	Development Provision
transport, walking and cycling.	

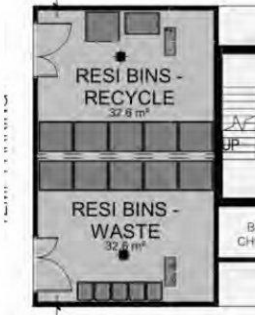
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## Waste Management

Council ESD objectives:

- To ensure waste avoidance, reuse and recycling during the design, construction and operation stages of development.
- To ensure long term reusability of building materials.
- To meet Councils' requirement that all multi-unit developments must provide a Waste Management Plan in accordance with the *Guide to Best Practice for Waste Management in Multi-unit Developments 2010*, published by Sustainability Victoria.

### Council Best Practice Standard



Criteria	Development Provision
Building Re-use	<p>To ensure waste avoidance, reuse and recycling during the design.</p> <p>None of the existing structure is re-used.</p>
Food & Garden Waste	<p>To ensure waste avoidance, reuse and recycling during the operational life of the building.</p> <p>Green waste storage is provided at podium level 1 adjacent to the productive community garden.</p>
Convenience of Recycling	<p>To ensure waste avoidance, reuse and recycling during the operational life of the building.</p> <div style="text-align: center;">  </div> <p>Separate general and recycling waste storage will be provided at the basement bin room.</p>

## Urban Ecology

Council ESD objectives:


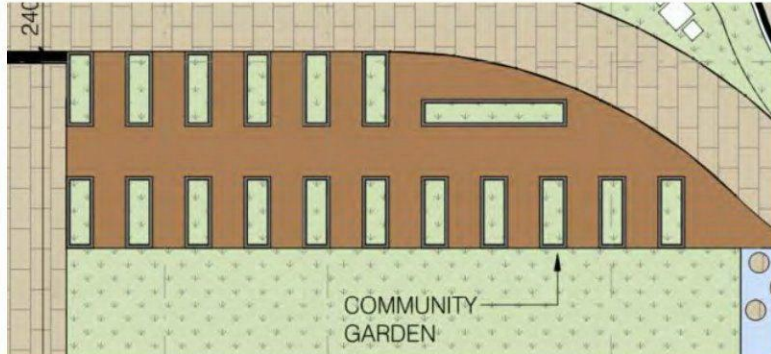
- To protect and enhance biodiversity.
- To provide sustainable landscaping.
- To protect and manage all remnant indigenous plant communities.
- To encourage the planting of indigenous vegetation.

### Council Best Practice Standard

Criteria	Development Provision
Communal Space	<p>2,210m<sup>2</sup> of communal space will be provided at level 1 podium and roof. Communal space will include the following amenities: landscaped area, dining, communal gardens, co-working, outdoor seating, yoga / multi-functional room, bbq area and outdoor seating.</p> 
<p>To encourage and recognise initiatives that facilitate interaction between building occupants.</p>	
Vegetation	<p>Communal space will be provided at level 1 podium and roof.</p> <p>To encourage and recognise the use of vegetation and landscaping within and</p> <p>Planter boxes are to be located at ground floor, level 1 balconies and roof.</p> <p>Landscaped area is to be located adjacent to the outdoor carpark and at level 1 podium.</p>



**Council Best Practice Standard**

Criteria	Development Provision	
around developments.	The total area of vegetation is 36% of the site area.	
Green Walls / Roof	To encourage the appropriate use of green roofs, walls and facades to mitigate the impact of the urban heat island effect.	The proposed development will incorporate a green roof at level 1.  Green roof location.
Private Open Space - Balcony / Courtyard Ecology	To encourage plants in a healthy ecological context to be grown on balconies and in courtyards.	NIL
Food Production - Residential	To encourage the production of fresh food on-site.	22m <sup>2</sup> of communal food production area will be provided.  The communal food production area will be provided at level 1 podium.

## Appendices

### Appendix A: WSUD Response

#### Site layout Plan

The following architectural mark-up illustrates the rainwater collection and impervious areas of the proposed development site.

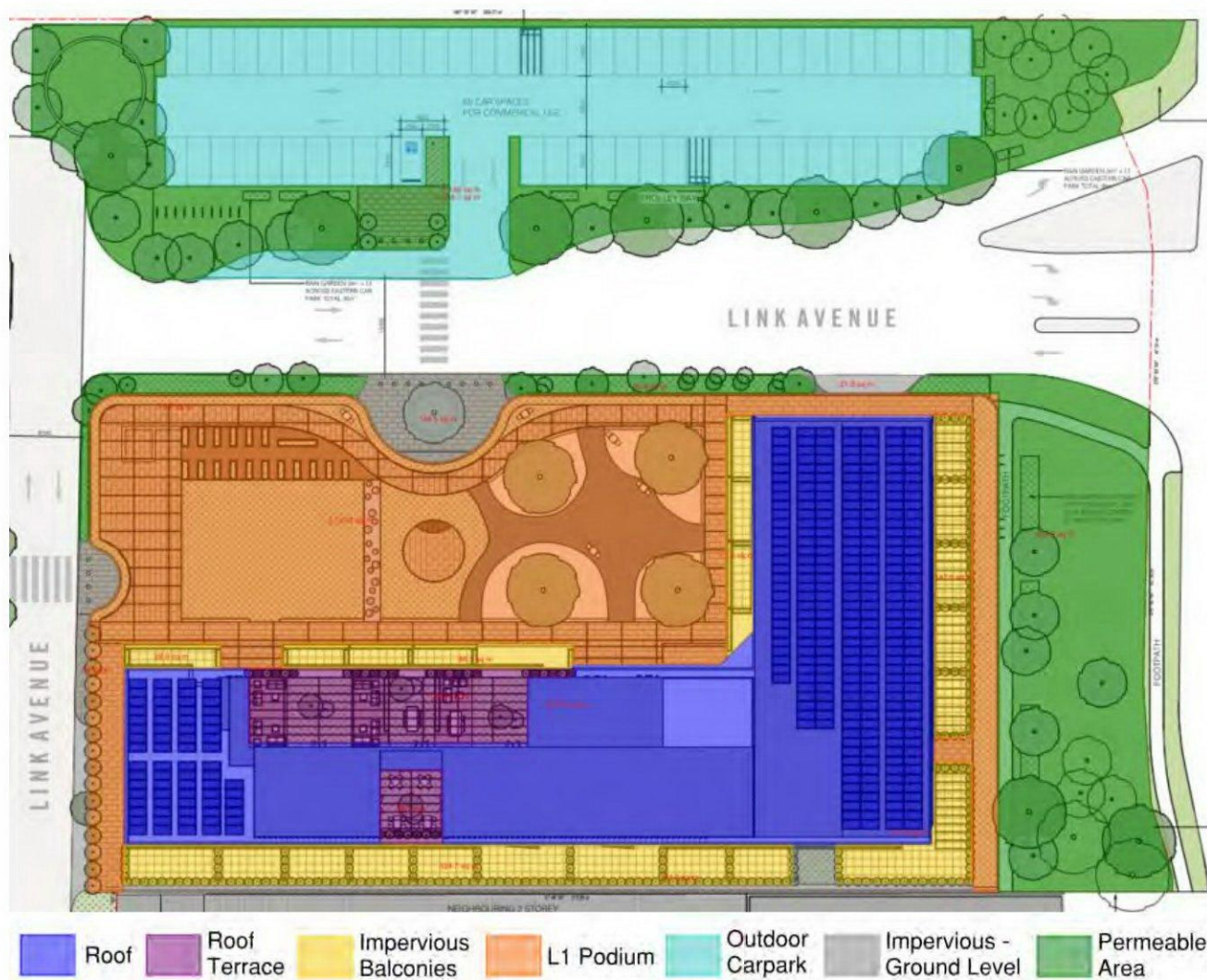


Figure 1 - Mark-up of water catchment and impervious areas

## STORM Rating Report

A STORM rating of  $\geq 100\%$  can be achieved by implementing the following initiatives:

- Rainwater is to be collected from the roof areas and directed into the 30,000 litre rainwater tank. All commercial WC's are to be connected to the rainwater tank.
- Rainwater is to be collected from level 1 podium and directed into a  $\geq 44\text{m}^2$ , minimum 950mm deep raingarden with 100mm of extended detention.
- Rainwater is to be collected from the outdoor carpark and directed into a total  $\geq 33\text{m}^2$ , minimum 950mm deep raingardens with 100mm of extended detention.

Melbourne Water has developed the Stormwater Treatment Objective- Relative Measure (STORM) Calculator as a method of simplifying the analysis of stormwater treatment methods. The STORM Calculator displays the amount of treatment that is required to meet best practice targets, using WSUD treatment measures.

The best practice standards have been set out in the Urban Stormwater Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999) for reduction in total suspended solids (TSS), total phosphorus (TP) and total nitrogen (TN) loads.

The STORM Result is provided below:

 <b>STORM Rating Report</b>						
TransactionID:	1188966					
Municipality:	MONASH					
Rainfall Station:	MONASH					
Address:	1042 Centre Rd					
	Oakleigh South					
	VIC 3167					
Assessor:	GIW					
Development Type:	Residential - Mixed Use					
Allotment Site (m2):	9,597.00					
STORM Rating %:	103					
Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Roof	1,977.00	Rainwater Tank	30,000.00	100	125.50	88.00
Roof Terraces	313.00	None	0.00	0	0.00	0.00
Balconies	760.00	None	0.00	0	0.00	0.00
L1 Podium	2,194.00	Raingarden 100mm	44.00	0	128.10	0.00
Carpark	1,664.00	Raingarden 100mm	33.00	0	128.00	0.00
Impervious Other	305.00	None	0.00	0	0.00	0.00

WSUD Strategy

The development will include the provision of a 30,000 litre rainwater tank and associated pump in the under the loading dock. The rainwater tank is to be connected to all commercial WC's.

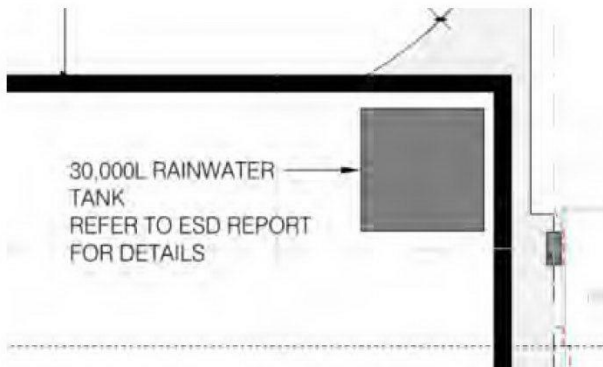


Figure 2 – Location Rainwater Tank

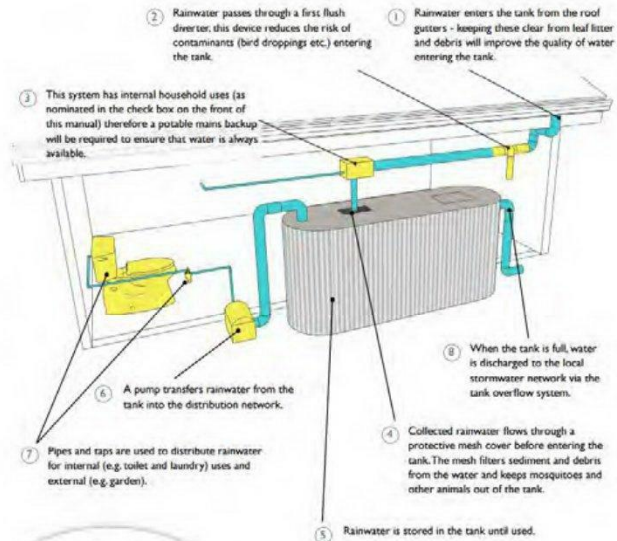


Figure 3 – Cross-section Tank  
(City of Port Phillip)

Furthermore, a total of  $\geq 44m^2$  and  $\geq 33m^2$  minimum 950mm deep raingarden with 100mm of extended detention is to be provided. Rainwater collected from respectively the level 1 podium and outdoor carpark is to be directed into the raingardens for treatment prior to discharge into the stormwater system.

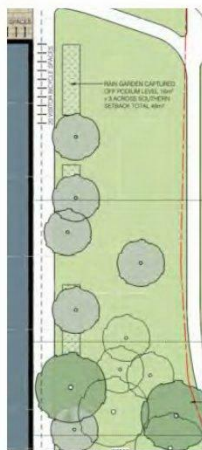


Figure 2 – Location Raingarden

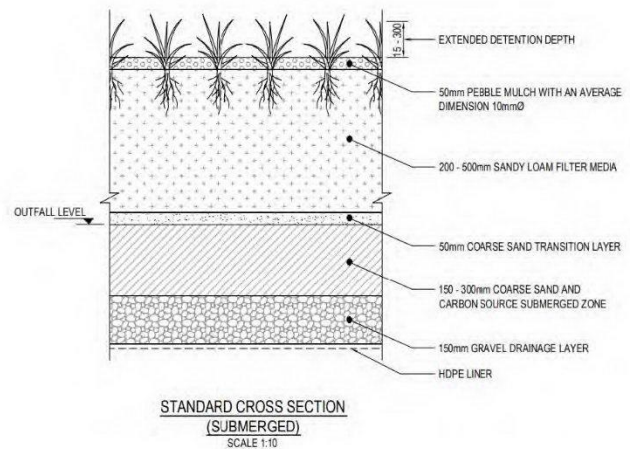


Figure 3 – Cross-section Raingarden  
(City of Moreland)

### Rainwater Reuse

#### Inputs

Catchment Area	1977 sqm
Number of Occupants	100
Bin Washout	No
Irrigation Area	0 sqm
Tank Capacity	30,000 Litre

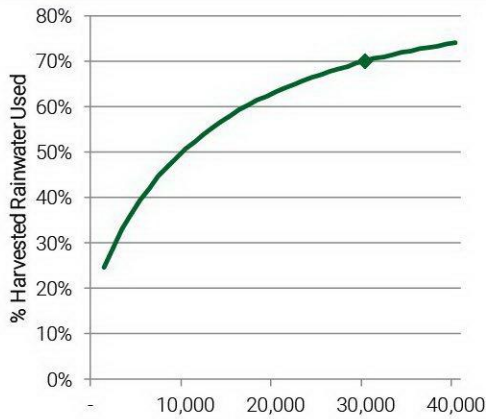
#### Outputs

% Served by Rainwater	72.7%
% Harvested Rainwater Used	70.1%
Total Potable Water Saved	371,456 Litre

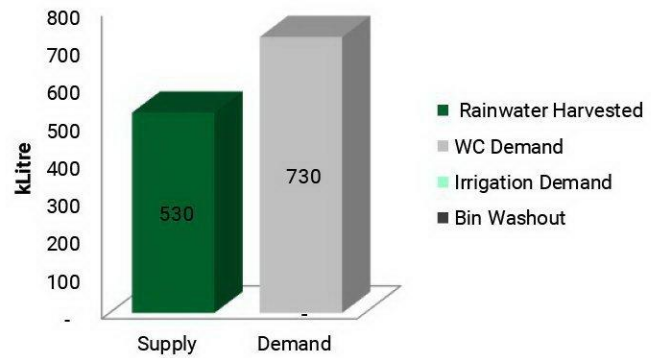
#### Rainwater Balance (Monthly Averages)

Month	Rainwater Harvested (L)	Irrigation Demand (L)	WC Demand (L)	Bin Washout (L)
Jan	39,405	0	62,000	0
Feb	40,562	0	56,000	0
Mar	39,358	0	62,000	0
Apr	42,329	0	60,000	0
May	43,552	0	62,000	0
Jun	46,666	0	60,000	0
Jul	38,296	0	62,000	0
Aug	48,467	0	62,000	0
Sep	48,164	0	60,000	0
Oct	46,548	0	62,000	0
Nov	54,585	0	60,000	0
Dec	42,041	0	62,000	0
Total	529,973	0	730,000	0
Equivalent STORM tool		0		0

#### Tank Sizing



#### Supply-Demand



## Site Management Statement

Prevention of litter, sediments and pollution entering the stormwater system in the construction phase is to be addressed through introduction of the following initiatives:

- Buffer strips to prevent stormwater runoff.
- Gravel sausage filters at stormwater inlets to prevent silt, mud or any other site contaminant from entering the stormwater system.
- Silt fences under grates at surface entry inlets to prevent sediment from entering the stormwater system.
- Temporary rumble grids to vibrate mud and dirt off vehicles prior to leaving the site.
- The site is to be kept clean from any loose rubbish or rubble.
- Introduction of offsite construction for building elements where deemed appropriate.

The builder is to include these initiatives in the construction management plan and address these during site induction of relevant contractors.

## Maintenance Program

The following maintenance requirements are to be programmed to ensure the rainwater tank operates effectively:

Item	Description	Maintenance Interval
Gutters and downpipes	Eave and box gutters are to be inspected and cleaned to prevent large debris from being washed into rainwater tank.	3 monthly
First flush system (as applicable)	Inspect and clean excess sediment from diverter chamber to prevent blockages.	3 monthly
Tank contents	Siphon the tank to inspect contents. If sludge is present, a plumber will be required to drain tank contents and clean the tank.	2 to 3 years
Tank structure	Inspect tank externally for leaks	Yearly
Pump system	Inspect pump wiring, plumbing and check for smooth operation.	6 monthly
Plumbing	Plumbing and fixtures connected to the rainwater tank is to be inspected for leaks.	Yearly

The following maintenance requirements are to be programmed to ensure the raingarden operates effectively:

Item	Description	Maintenance Interval
Kerbing and paved area	Remove rubbish, leaves and other debris from the surrounding drainage area.	3 monthly
Ponding area	Clear inflow points of built up sediment, rubbish and leaves. Check for erosion or gouging – repair if necessary.	3 monthly
Mulch layer (bark, pebbles, etc.)	Remove rubbish, leaves and other debris. After storm events mulch may need to be redistributed or added around inflow points.	3 monthly
Plants	Water establishing plants monthly during extended dry periods. Check plant health and replace dead plants as necessary. Use native species to suit garden conditions (e.g. full sun or shaded). Remove weeds – do not use herbicides, pesticides and fertilisers as these chemicals will pollute the stormwater runoff.	3 monthly
Rain garden soil mix	Check soil level is below surrounding hard surface level and overflow grate. Use drainage test to check soil is free draining.	Annually
Underdrain system	Use inspection well (if present) to check underdrain is working properly. Check rain garden draining freely using drainage test.	Annually

## Appendix B: Preliminary FirstRate Certificates



# Nationwide House Energy Rating Scheme

## NatHERS Certificate No. 0LXNMSJRIA

Generated on 27 Jul 2021 using FirstRate5: 5.3.1a (3.21)

### Property

<b>Address</b>	2.18, 1041 Centre Rd, Oakleigh South, Oakleigh South, VIC, 3167
<b>Lot/DP</b>	-
<b>NCC Class*</b>	Class 2
<b>Type</b>	New Home

### Plans

<b>Main plan</b>	-
<b>Prepared by</b>	-

### Construction and environment

<b>Assessed floor area (m<sup>2</sup>)*</b>		<b>Exposure type</b>	
Conditioned*	43.2	open	
Unconditioned*	5	<b>NatHERS climate zone</b>	
Total	48.2	62, Oakleigh South	
Garage	-		



### Accredited assessor

<b>Name</b>	Gary Wertheimer
<b>Business name</b>	GIW Environmental Solutions
<b>Email</b>	gary@giw.com.au
<b>Phone</b>	0390445111
<b>Accreditation No.</b>	DMN/10/2024
<b>Assessor Accrediting Organisation</b>	DMN
<b>Declaration of interest</b>	Declaration completed: no conflicts

### National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at [www.abcb.gov.au](http://www.abcb.gov.au).

State and territory variations and additions to the NCC may also apply.



**59.1 MJ/m<sup>2</sup>**

Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:  
[www.nathers.gov.au](http://www.nathers.gov.au)

### Thermal performance

<b>Heating</b>	<b>Cooling</b>
<b>43.9</b>	<b>15.2</b>
<b>MJ/m<sup>2</sup></b>	<b>MJ/m<sup>2</sup></b>

### About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

### Verification

To verify this certificate, scan the QR code or visit [When using either link, ensure you are visiting \[www.FR5.com.au\]\(http://www.FR5.com.au\).](#)

## Certificate Check

Ensure the dwelling is designed and then built as per the NatHERS Certificate. While you need to check the accuracy of the whole Certificate, the following spot check covers some important items impacting the dwelling's rating.

### Genuine certificate

Does this Certificate match the one available at the web address or QR code in the verification box on the front page?  
Does the set of NatHERS-stamped plans for the dwelling have a Certificate number on the stamp that matches this Certificate?

### Ceiling penetrations\*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

### Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

### Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

### Exposure\*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

### Provisional\* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

## Additional Notes

### Window and glazed door *type and performance*

#### Default\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

#### Custom\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5
CAP-051-06 A	Capral 35 Awning in 400 Frame DG 6EA/12Ar/6	4.42	0.41	0.39	0.43
CAP-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61

### Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living 1	CAP-057-13 A	Opening 3	2700	2600	sliding	45.0	W	Yes
Bedroom 2	CAP-051-06 A	Opening 4	2700	3000	awning	30.0	W	No

## 0LXNMSJRIA NatHERS Certificate

7.9 Star Rating as of 27 Jul 2021

Bedroom 2	CAP-041-52 A	Opening 5	2700	600	fixed	0.0	N	No
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## Roof window type and performance value

## Default\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Custom\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Indoor shade
No Data Available							

## Skylight type and performance

Skylight ID	Skylight description
No Data Available	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

## External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
No Data Available				

## External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	1041Centre - Concrete Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	1041Centre - Plasterboard Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living 1	1	2700	3556	W	2214	Yes
Kitchen/Living 1	2	2700	1198	S	0	No

\* Refer to glossary.

## 0LXNMSJRIA NatHERS Certificate

7.9 Star Rating as of 27 Jul 2021

Kitchen/Living 1	2	2700	3556	E	0	No
Kitchen/Living 1	2	2700	6445	N	0	No
Bedroom 2	1	2700	2941	W	0	No
Bedroom 2	1	2700	2280	S	3591	Yes
Bedroom 2	2	2700	3404	S	0	No
Bedroom 2	1	2700	2315	N	3489	Yes
Bathroom	2	2700	1658	S	0	No
Bathroom	2	2700	3022	E	0	No

## Internal wall type

Wall ID	Wall type	Area (m <sup>2</sup> )	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	29.5	

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living 1	FR5 - 200mm concrete slab	26.5	Enclosed	R0.0	Timber
Bedroom 2	FR5 - 200mm concrete slab	16.7	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	5	Enclosed	R0.0	Tiles

## Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
No Data Available			

## Ceiling penetrations\*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living 1	1	Exhaust Fans	200	Sealed
Kitchen/Living 1	10	Downlights	80	Sealed
Bedroom 2	6	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed

## Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

## Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 200mm: 200mm Suspended Slab	0.0	0.5	Medium

## Explanatory Notes

### About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

Ratings are based on a unique climate zone where the home is located and are generated using standard assumptions, including occupancy patterns and thermostat settings. The actual energy consumption of a home may vary significantly from the predicted energy load, as the assumptions used in the rating will not match actual usage patterns. For example, the number of occupants and personal heating or cooling preferences will vary.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparing different dwelling designs and to demonstrate that the design meets the energy efficiency requirements in the National Construction Code. Homes that are energy efficient use less energy, are warmer on cool days, cooler on hot days and cost less to run. The higher the star rating the more thermally efficient the dwelling is.

### Accredited assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

Australian Capital Territory (ACT) licensed assessors may only produce assessments for regulatory purposes using software for which they have a licence endorsement. Licence endorsements can be confirmed on the ACT licensing register.

## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans, pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

### Disclaimer

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings are likely to perform when used in a similar way. Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, indoor air temperature and local climate.

Not all assumptions that may have been made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening Percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
<b>Vertical shading features</b>	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

# Nationwide House Energy Rating Scheme

## NatHERS Certificate No. CJO5YIEN71

Generated on 27 Jul 2021 using FirstRate5: 5.3.1a (3.21)

### Property

**Address** 3.14, 1041 Centre Rd, Oakleigh South, Oakleigh South, VIC, 3167  
**Lot/DP** -  
**NCC Class\*** Class 2  
**Type** New Home

### Plans

**Main plan** -  
**Prepared by** -



## 104.8 MJ/m<sup>2</sup>

Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:  
[www.nathers.gov.au](http://www.nathers.gov.au)

### Construction and environment

<b>Assessed floor area (m<sup>2</sup>)*</b>		<b>Exposure type</b>
Conditioned*	55.4	open
Unconditioned*	5	<b>NatHERS climate zone</b>
Total	60.4	62, Oakleigh South
Garage	-	

### Thermal performance

<b>Heating</b>	<b>Cooling</b>
<b>84.8</b>	<b>20</b>
<b>MJ/m<sup>2</sup></b>	<b>MJ/m<sup>2</sup></b>

#### About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

#### Verification

To verify this certificate, scan the QR code or visit [When using either link, ensure you are visiting www.FR5.com.au](http://When using either link, ensure you are visiting www.FR5.com.au)



### Accredited assessor

<b>Name</b>	Gary Wertheimer
<b>Business name</b>	GIW Environmental Solutions
<b>Email</b>	<a href="mailto:gary@giw.com.au">gary@giw.com.au</a>
<b>Phone</b>	0390445111
<b>Accreditation No.</b>	DMN/10/2024
<b>Assessor Accrediting Organisation</b>	DMN
<b>Declaration of interest</b>	Declaration completed: no conflicts

### National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at [www.abcb.gov.au](http://www.abcb.gov.au).

State and territory variations and additions to the NCC may also apply.

## Certificate Check

Ensure the dwelling is designed and then built as per the NatHERS Certificate. While you need to check the accuracy of the whole Certificate, the following spot check covers some important items impacting the dwelling's rating.

### Genuine certificate

Does this Certificate match the one available at the web address or QR code in the verification box on the front page?  
Does the set of NatHERS-stamped plans for the dwelling have a Certificate number on the stamp that matches this Certificate?

### Ceiling penetrations\*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

### Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

### Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

### Exposure\*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

### Provisional\* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

## Additional Notes

### Window and glazed door *type and performance*

#### Default\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

#### Custom\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
CAP-051-06 A	Capral 35 Awning in 400 Frame DG 6EA/12Ar/6	4.42	0.41	0.39	0.43
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5

### Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living 1	CAP-051-06 A	Opening 5	2700	3600	awning	30.0	W	No
Kitchen/Living 1	CAP-057-13 A	Opening 6	2700	2300	sliding	45.0	N	No
Bedroom 2	CAP-057-13 A	Opening 4	2700	2000	sliding	45.0	W	No

\* Refer to glossary.



## CJQ5YIEN71 NatHERS Certificate

6.6 Star Rating as of 27 Jul 2021

Bedroom 3	CAP-057-13 A	Opening 7	2700	2000	sliding	45.0	W	No
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## Roof window type and performance value

Default\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

Custom\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Indoor shade
No Data Available							

## Skylight type and performance

Skylight ID	Skylight description
No Data Available	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

## External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
No Data Available				

## External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	1041Centre - Concrete Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	1041Centre - Plasterboard Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living 1	1	2700	3515	W	480	No
Kitchen/Living 1	1	2700	2593	S	0	Yes

\* Refer to glossary.

## CJQ5YIEN71 NatHERS Certificate

6.6 Star Rating as of 27 Jul 2021

Room	Count	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Orientation	Insulation	Sealed
Kitchen/Living 1	2	2700	3532	E	0	No
Kitchen/Living 1	1	2700	5041	N	3047	Yes
Bedroom 2	1	2700	3111	W	2708	Yes
Bedroom 2	2	2700	3111	E	0	No
Bedroom 2	2	2700	3684	N	0	No
Bedroom 3	1	2700	2979	W	0	Yes
Bedroom 3	2	2700	4348	S	0	No
Bathroom	2	2700	1685	S	0	No
Bathroom	2	2700	2955	E	0	No

## Internal wall type

Wall ID	Wall type	Area (m <sup>2</sup> )	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	34.3	

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living 1	FR5 - 200mm concrete slab	31	Enclosed	R0.0	Timber
Bedroom 2	FR5 - 200mm concrete slab	11.5	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 200mm concrete slab	12.9	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	5	Enclosed	R0.0	Tiles

## Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
No Data Available			

## Ceiling penetrations\*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living 1	1	Exhaust Fans	200	Sealed
Kitchen/Living 1	12	Downlights	80	Sealed
Bedroom 2	4	Downlights	80	Sealed
Bedroom 3	5	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed

## Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

## Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 200mm: 200mm Suspended Slab	0.0	0.5	Medium

\* Refer to glossary.

## Explanatory Notes

### About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

Ratings are based on a unique climate zone where the home is located and are generated using standard assumptions, including occupancy patterns and thermostat settings. The actual energy consumption of a home may vary significantly from the predicted energy load, as the assumptions used in the rating will not match actual usage patterns. For example, the number of occupants and personal heating or cooling preferences will vary.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparing different dwelling designs and to demonstrate that the design meets the energy efficiency requirements in the National Construction Code. Homes that are energy efficient use less energy, are warmer on cool days, cooler on hot days and cost less to run. The higher the star rating the more thermally efficient the dwelling is.

### Accredited assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

Australian Capital Territory (ACT) licensed assessors may only produce assessments for regulatory purposes using software for which they have a licence endorsement. Licence endorsements can be confirmed on the ACT licensing register.

## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans, pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

### Disclaimer

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings are likely to perform when used in a similar way. Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, indoor air temperature and local climate.

Not all assumptions that may have been made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening Percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
<b>Vertical shading features</b>	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

# Nationwide House Energy Rating Scheme

## NatHERS Certificate No. C98Z44AR40

Generated on 27 Jul 2021 using FirstRate5: 5.3.1a (3.21)

### Property

**Address** 4.01, 1041 Centre Rd, Oakleigh South, Oakleigh South, VIC, 3167  
**Lot/DP** -  
**NCC Class\*** Class 2  
**Type** New Home

### Plans

**Main plan** -  
**Prepared by** -

### Construction and environment

<b>Assessed floor area (m<sup>2</sup>)*</b>		<b>Exposure type</b>
Conditioned*	74.1	open
Unconditioned*	4.9	<b>NatHERS climate zone</b>
Total	79	62, Oakleigh South
Garage	-	



### Accredited assessor

**Name** Gary Wertheimer  
**Business name** GIW Environmental Solutions  
**Email** gary@giw.com.au  
**Phone** 0390445111  
**Accreditation No.** DMN/10/2024  
**Assessor Accrediting Organisation** DMN  
**Declaration of interest** Declaration completed: no conflicts

### National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at [www.abcb.gov.au](http://www.abcb.gov.au).

State and territory variations and additions to the NCC may also apply.



## 48.4 MJ/m<sup>2</sup>

Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:

[www.nathers.gov.au](http://www.nathers.gov.au)

### Thermal performance

Heating	Cooling
37	11.4
MJ/m <sup>2</sup>	MJ/m <sup>2</sup>

### About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

### Verification

To verify this certificate, scan the QR code or visit [www.FR5.com.au](http://www.FR5.com.au) When using either link, ensure you are visiting [www.FR5.com.au](http://www.FR5.com.au).

## Certificate Check

Ensure the dwelling is designed and then built as per the NatHERS Certificate. While you need to check the accuracy of the whole Certificate, the following spot check covers some important items impacting the dwelling's rating.

### Genuine certificate

Does this Certificate match the one available at the web address or QR code in the verification box on the front page?  
Does the set of NatHERS-stamped plans for the dwelling have a Certificate number on the stamp that matches this Certificate?

### Ceiling penetrations\*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

### Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

### Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

### Exposure\*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

### Provisional\* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

## Additional Notes

### Window and glazed door *type and performance*

#### Default\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

#### Custom\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
CAP-051-06 A	Capral 35 Awning in 400 Frame DG 6EA/12Ar/6	4.42	0.41	0.39	0.43
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5

### Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living 1	CAP-051-06 A	Opening 1	2700	3600	awning	30.0	NE	No
Bedroom 2	CAP-057-13 A	Opening 2	2700	1900	sliding	45.0	NE	No
Bedroom 3	CAP-057-13 A	Opening 3	2700	2100	sliding	45.0	E	No

\* Refer to glossary.

## Roof window type and performance value

### Default\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

### Custom\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Indoor shade
No Data Available							

## Skylight type and performance

Skylight ID	Skylight description
No Data Available	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

## External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
No Data Available				

## External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	1041Centre - Concrete Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m <sup>3</sup> ) (R1.8)	No
2	1041Centre - Plasterboard Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m <sup>3</sup> ) (R1.8)	No
3	1041Centre - Concrete Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m <sup>3</sup> ) (R1.8)	No

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living 1	1	2700	3577	NE	0	Yes
Kitchen/Living 1	2	2700	1838	NW	0	No

\* Refer to glossary.

## C98Z44AR40 NatHERS Certificate

8.3 Star Rating as of 27 Jul 2021

Room	Count	Area (m <sup>2</sup> )	Volume (m <sup>3</sup> )	Orientation	U-value	Insulation
Kitchen/Living 1	2	2700	8561	SE	0	No
Bedroom 2	1	2700	1931	NE	3605	Yes
Bedroom 3	3	2700	3577	N	0	No
Bedroom 3	1	2700	3005	E	3398	Yes
Bathroom	2	2700	965	NW	0	No
Bathroom	2	2700	1106	W	0	No
Bathroom	2	2700	2781	SW	0	No
Bathroom	2	2700	1743	SE	0	No
Corridor	2	2700	4140	W	0	No
Corridor	2	2700	2795	SW	0	No
Ensuite	3	2700	1633	N	0	No
Ensuite	2	2700	2990	W	0	No

## Internal wall type

Wall ID	Wall type	Area (m <sup>2</sup> )	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	67.5	

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living 1	FR5 - 200mm concrete slab	30.9	Enclosed	R0.0	Timber
Bedroom 2	FR5 - 200mm concrete slab	13.7	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 200mm concrete slab	10.8	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	5.9	Enclosed	R0.0	Tiles
Corridor	FR5 - 200mm concrete slab	12.8	Enclosed	R0.0	Timber
Ensuite	FR5 - 200mm concrete slab	4.9	Enclosed	R0.0	Tiles

## Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
No Data Available			

## Ceiling penetrations\*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living 1	1	Exhaust Fans	200	Sealed
Kitchen/Living 1	12	Downlights	80	Sealed
Bedroom 2	5	Downlights	80	Sealed
Bedroom 3	4	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed
Corridor	5	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	200	Sealed
Ensuite	2	Downlights	80	Sealed

\* Refer to glossary.



**Ceiling fans****Location****Quantity****Diameter (mm)**

No Data Available

**Roof type****Construction****Added insulation (R-value)****Solar absorptance****Roof shade**

Slab:Slab - Suspended Slab : 200mm: 200mm

Suspended Slab

0.0

0.5

Medium

## Explanatory Notes

### About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

Ratings are based on a unique climate zone where the home is located and are generated using standard assumptions, including occupancy patterns and thermostat settings. The actual energy consumption of a home may vary significantly from the predicted energy load, as the assumptions used in the rating will not match actual usage patterns. For example, the number of occupants and personal heating or cooling preferences will vary.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparing different dwelling designs and to demonstrate that the design meets the energy efficiency requirements in the National Construction Code. Homes that are energy efficient use less energy, are warmer on cool days, cooler on hot days and cost less to run. The higher the star rating the more thermally efficient the dwelling is.

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## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

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Not all assumptions that may have been made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening Percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
<b>Vertical shading features</b>	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

# Nationwide House Energy Rating Scheme

## NatHERS Certificate No. 8R5S22ZD9X

Generated on 27 Jul 2021 using FirstRate5: 5.3.1a (3.21)



### Property

<b>Address</b>	5.25, 1041 Centre Rd, Oakleigh South, Oakleigh South, VIC, 3167
<b>Lot/DP</b>	-
<b>NCC Class*</b>	Class 2
<b>Type</b>	New Home

### Plans

<b>Main plan</b>	-
<b>Prepared by</b>	-



### Construction and environment

<b>Assessed floor area (m<sup>2</sup>)*</b>		<b>Exposure type</b>	
Conditioned*	65.2	open	
Unconditioned*	4.4	<b>NatHERS climate zone</b>	
Total	69.6	62, Oakleigh South	
Garage	-		

### Thermal performance

<b>Heating</b>	<b>Cooling</b>
<b>75.9</b>	<b>15.7</b>
<b>MJ/m<sup>2</sup></b>	<b>MJ/m<sup>2</sup></b>

#### About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

#### Verification

To verify this certificate, scan the QR code or visit [When using either link, ensure you are visiting www.FR5.com.au.](http://www.FR5.com.au)



### Accredited assessor

<b>Name</b>	Gary Wertheimer
<b>Business name</b>	GIW Environmental Solutions
<b>Email</b>	<a href="mailto:gary@giw.com.au">gary@giw.com.au</a>
<b>Phone</b>	0390445111
<b>Accreditation No.</b>	DMN/10/2024
<b>Assessor Accrediting Organisation</b>	DMN
<b>Declaration of interest</b>	Declaration completed: no conflicts

### National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at [www.abcb.gov.au](http://www.abcb.gov.au).

State and territory variations and additions to the NCC may also apply.

\* Refer to glossary.

## Certificate Check

Ensure the dwelling is designed and then built as per the NatHERS Certificate. While you need to check the accuracy of the whole Certificate, the following spot check covers some important items impacting the dwelling's rating.

### Genuine certificate

Does this Certificate match the one available at the web address or QR code in the verification box on the front page?  
Does the set of NatHERS-stamped plans for the dwelling have a Certificate number on the stamp that matches this Certificate?

### Ceiling penetrations\*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

### Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

### Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

### Exposure\*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

### Provisional\* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

## Additional Notes

### Window and glazed door *type and performance*

#### Default\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

#### Custom\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
CAP-051-06 A	Capral 35 Awning in 400 Frame DG 6EA/12Ar/6	4.42	0.41	0.39	0.43
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5

### Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living 1	CAP-051-06 A	Opening 6	2700	3600	awning	20.0	E	No
Kitchen/Living 1	CAP-057-13 A	Opening 8	2700	1400	sliding	45.0	N	No
Bedroom 2	CAP-057-13 A	Opening 5	2700	2000	sliding	45.0	E	Yes

\* Refer to glossary.

## 8R5S22ZD9X NatHERS Certificate

6.9 Star Rating as of 27 Jul 2021

Bedroom 4	CAP-051-06 A	Opening 7	2700	2550	awning	30.0	E	No
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## Roof window type and performance value

Default\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

Custom\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Indoor shade
No Data Available							

## Skylight type and performance

Skylight ID	Skylight description
No Data Available	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

## External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
No Data Available				

## External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	1041Centre - Plasterboard Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
2	1041Centre - Concrete Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
3	1041Centre - Concrete Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living 1	1	2700	3635	W	0	No

\* Refer to glossary.

Generated on 27 Jul 2021 using FirstRate5: 5.3.1a (3.21) for 5.25, 1041 Centre Rd, Oakleigh South,

## 8R5S22ZD9X NatHERS Certificate

6.9 Star Rating as of 27 Jul 2021

Kitchen/Living 1	2	2700	2176	S	0	Yes
Kitchen/Living 1	2	2700	3635	E	400	No
Kitchen/Living 1	2	2700	2730	N	2860	Yes
Bedroom 2	2	2700	2969	E	2673	Yes
Bedroom 2	1	2700	4147	N	0	No
Bathroom	1	2700	2943	W	0	No
Bathroom	1	2700	1654	N	0	No
Bedroom 4	1	2700	1673	W	0	No
Bedroom 4	3	2700	3452	S	0	No
Bedroom 4	2	2700	3301	E	0	Yes
Ensuite	1	2700	1497	W	0	No
Ensuite	3	2700	2875	S	0	No

## Internal wall type

Wall ID	Wall type	Area (m <sup>2</sup> )	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	53.1	

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living 1	FR5 - 200mm concrete slab	31.5	Enclosed	R0.0	Timber
Bedroom 2	FR5 - 200mm concrete slab	12.3	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	4.9	Enclosed	R0.0	Tiles
Bedroom 4	FR5 - 200mm concrete slab	16.5	Enclosed	R0.0	Carpet
Ensuite	FR5 - 200mm concrete slab	4.4	Enclosed	R0.0	Tiles

## Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
No Data Available			

## Ceiling penetrations\*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living 1	1	Exhaust Fans	200	Sealed
Kitchen/Living 1	12	Downlights	80	Sealed
Bedroom 2	5	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed
Bedroom 4	6	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	200	Sealed
Ensuite	2	Downlights	80	Sealed

## Ceiling fans

\* Refer to glossary.

Location	Quantity	Diameter (mm)
No Data Available		

**Roof type**

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 200mm: 200mm Suspended Slab	0.0	0.5	Medium



## Explanatory Notes

### About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

Ratings are based on a unique climate zone where the home is located and are generated using standard assumptions, including occupancy patterns and thermostat settings. The actual energy consumption of a home may vary significantly from the predicted energy load, as the assumptions used in the rating will not match actual usage patterns. For example, the number of occupants and personal heating or cooling preferences will vary.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparing different dwelling designs and to demonstrate that the design meets the energy efficiency requirements in the National Construction Code. Homes that are energy efficient use less energy, are warmer on cool days, cooler on hot days and cost less to run. The higher the star rating the more thermally efficient the dwelling is.

### Accredited assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

Australian Capital Territory (ACT) licensed assessors may only produce assessments for regulatory purposes using software for which they have a licence endorsement. Licence endorsements can be confirmed on the ACT licensing register

## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
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<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
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<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
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# Nationwide House Energy Rating Scheme

## NatHERS Certificate No. R0ZXKGTXXR

Generated on 27 Jul 2021 using FirstRate5: 5.3.1a (3.21)

### Property

<b>Address</b>	6.06, 1041 Centre Rd, Oakleigh South, Oakleigh South, VIC, 3167
<b>Lot/DP</b>	-
<b>NCC Class*</b>	Class 2
<b>Type</b>	New Home

### Plans

<b>Main plan</b>	-
<b>Prepared by</b>	-

### Construction and environment

<b>Assessed floor area (m<sup>2</sup>)*</b>		<b>Exposure type</b>	
Conditioned*	35.8	open	
Unconditioned*	5.3	<b>NatHERS climate zone</b>	
Total	41.1	62, Oakleigh South	
Garage	-		



### Accredited assessor

<b>Name</b>	Gary Wertheimer
<b>Business name</b>	GIW Environmental Solutions
<b>Email</b>	gary@giw.com.au
<b>Phone</b>	0390445111
<b>Accreditation No.</b>	DMN/10/2024
<b>Assessor Accrediting Organisation</b>	DMN
<b>Declaration of interest</b>	Declaration completed: no conflicts

### National Construction Code (NCC) requirements

The NCC's requirements for NatHERS-rated houses are detailed in 3.12.0(a)(i) and 3.12.5 of the NCC Volume Two. For apartments the requirements are detailed in J0.2 and J5 to J8 of the NCC Volume One.

In NCC 2019, these requirements include minimum star ratings and separate heating and cooling load limits that need to be met by buildings and apartments through the NatHERS assessment. Requirements additional to the NatHERS assessment that must also be satisfied include, but are not limited to: insulation installation methods, thermal breaks, building sealing, water heating and pumping, and artificial lighting requirements. The NCC and NatHERS Heating and Cooling Load Limits (Australian Building Codes Board Standard) are available at [www.abcb.gov.au](http://www.abcb.gov.au).

State and territory variations and additions to the NCC may also apply.



**95.4 MJ/m<sup>2</sup>**

Predicted annual energy load for heating and cooling based on standard occupancy assumptions.

For more information on your dwelling's rating see:

[www.nathers.gov.au](http://www.nathers.gov.au)

### Thermal performance

<b>Heating</b>	<b>Cooling</b>
<b>76.9</b>	<b>18.5</b>
<b>MJ/m<sup>2</sup></b>	<b>MJ/m<sup>2</sup></b>

### About the rating

NatHERS software models the expected thermal energy loads using information about the design and construction, climate and common patterns of household use. The software does not take into account appliances, apart from the airflow impacts from ceiling fans.

### Verification

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### Ceiling penetrations\*

Does the 'number' and 'type' of ceiling penetrations (e.g. downlights, exhaust fans, etc) shown on the stamped plans or installed, match what is shown in this Certificate?

### Windows

Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate?

### Apartment entrance doors

Does the 'External Door Schedule' show apartment entrance doors? Please note that an "external door" between the modelled dwelling and a shared space, such as an enclosed corridor or foyer, should not be included in the assessment (because it overstates the possible ventilation) and would invalidate the Certificate.

### Exposure\*

Has the appropriate exposure level (terrain) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".

### Provisional\* values

Have provisional values been used in the assessment and, if so, noted in "additional notes" below?

## Additional Notes

### Window and glazed door *type and performance*

#### Default\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

#### Custom\* windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
CAP-051-06 A	Capral 35 Awning in 400 Frame DG 6EA/12Ar/6	4.42	0.41	0.39	0.43

### Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Bedroom 1	CAP-051-06 A	Opening 9	2700	2700	awning	30.0	S	No
Kitchen/Living 2	CAP-051-06 A	Opening 10	2700	2200	awning	30.0	S	No

### Roof window *type and performance value*

\* Refer to glossary.

## R0ZXKGTXXKR NatHERS Certificate

6.9 Star Rating as of 27 Jul 2021

## Default\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Custom\* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
No Data Available					

## Roof window schedule

Location	Window ID	Window no.	Opening %	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Indoor shade
No Data Available							

## Skylight type and performance

Skylight ID	Skylight description
No Data Available	

## Skylight schedule

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m <sup>2</sup> )	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

## External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
No Data Available				

## External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	1041Centre - Concrete Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	1041Centre - Concrete Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
3	1041Centre - Plasterboard Int	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

## External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 1	1	2700	2750	N	0	No
Bedroom 1	2	2700	2738	S	0	No
Bedroom 1	2	2700	3258	E	0	No
Kitchen/Living 2	3	2700	3887	N	0	No

\* Refer to glossary.

## R0ZXKGTXXR NatHERS Certificate

6.9 Star Rating as of 27 Jul 2021

Kitchen/Living 2	3	2700	6279	W	0	No
Kitchen/Living 2	2	2700	2148	W	3567	Yes
Kitchen/Living 2	2	2700	3903	S	0	No
Kitchen/Living 2	1	2700	614	E	0	No
Kitchen/Living 2	1	2700	1441	E	0	No
Bathroom	1	2700	2937	E	0	No

## Internal wall type

Wall ID	Wall type	Area (m <sup>2</sup> )	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	26.3	

## Floor type

Location	Construction	Area (m <sup>2</sup> )	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - 200mm concrete slab	8.9	Enclosed	R0.0	Timber
Kitchen/Living 2	FR5 - 200mm concrete slab	26.9	Enclosed	R0.0	Timber
Bathroom	FR5 - 200mm concrete slab	5.3	Enclosed	R0.0	Tiles

## Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
No Data Available			

## Ceiling penetrations\*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 1	3	Downlights	80	Sealed
Kitchen/Living 2	1	Exhaust Fans	200	Sealed
Kitchen/Living 2	10	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed

## Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

## Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 200mm: 200mm Suspended Slab	0.0	0.5	Medium

## Explanatory Notes

### About this report

A NatHERS rating is a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate an energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances or energy production of solar panels.

Ratings are based on a unique climate zone where the home is located and are generated using standard assumptions, including occupancy patterns and thermostat settings. The actual energy consumption of a home may vary significantly from the predicted energy load, as the assumptions used in the rating will not match actual usage patterns. For example, the number of occupants and personal heating or cooling preferences will vary.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparing different dwelling designs and to demonstrate that the design meets the energy efficiency requirements in the National Construction Code. Homes that are energy efficient use less energy, are warmer on cool days, cooler on hot days and cost less to run. The higher the star rating the more thermally efficient the dwelling is.

### Accredited assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

Australian Capital Territory (ACT) licensed assessors may only produce assessments for regulatory purposes using software for which they have a licence endorsement. Licence endorsements can be confirmed on the ACT licensing register.

## Glossary

<b>Annual energy load</b>	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
<b>Assessed floor area</b>	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
<b>Ceiling penetrations</b>	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans, pendant lights, and heating and cooling ducts.
<b>Conditioned</b>	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
<b>Custom windows</b>	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
<b>Default windows</b>	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
<b>Entrance door</b>	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
<b>Exposure category - exposed</b>	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
<b>Exposure category - open</b>	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
<b>Exposure category - suburban</b>	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
<b>Exposure category - protected</b>	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
<b>Horizontal shading feature</b>	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

### Disclaimer

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings are likely to perform when used in a similar way. Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, indoor air temperature and local climate.

Not all assumptions that may have been made by the assessor while using the NatHERS accredited software tool are presented in this report and further details or data files may be available from the assessor.

<b>National Construction Code (NCC) Class</b>	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at <a href="http://www.abcb.gov.au">www.abcb.gov.au</a> .
<b>Opening Percentage</b>	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
<b>Provisional value</b>	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at <a href="http://www.nathers.gov.au">www.nathers.gov.au</a>
<b>Reflective wrap (also known as foil)</b>	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
<b>Roof window</b>	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
<b>Shading device</b>	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
<b>Shading features</b>	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
<b>Solar heat gain coefficient (SHGC)</b>	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
<b>Skylight (also known as roof lights)</b>	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
<b>U-value</b>	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
<b>Unconditioned</b>	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
<b>Vertical shading features</b>	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).



## Appendix C: Renewable Energy

### Solar PV

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#### Inputs Solar PV

Peak Wattage of System	21.0 kWp
Azimuth	0 degrees
Inclination	30 degrees

#### Outputs Solar PV

Electricity Produced per Year	30,274 kWh
No. Panels Required	70
Total Roof Area Required	145 sqm
Annual Carbon Savings	33,907 kg CO <sub>2</sub>

#### Economic Output

Cost of System	31,500 \$
Annual Savings	6,055 \$
Simple Payback	5 Years

#### Annual Common Area Demand

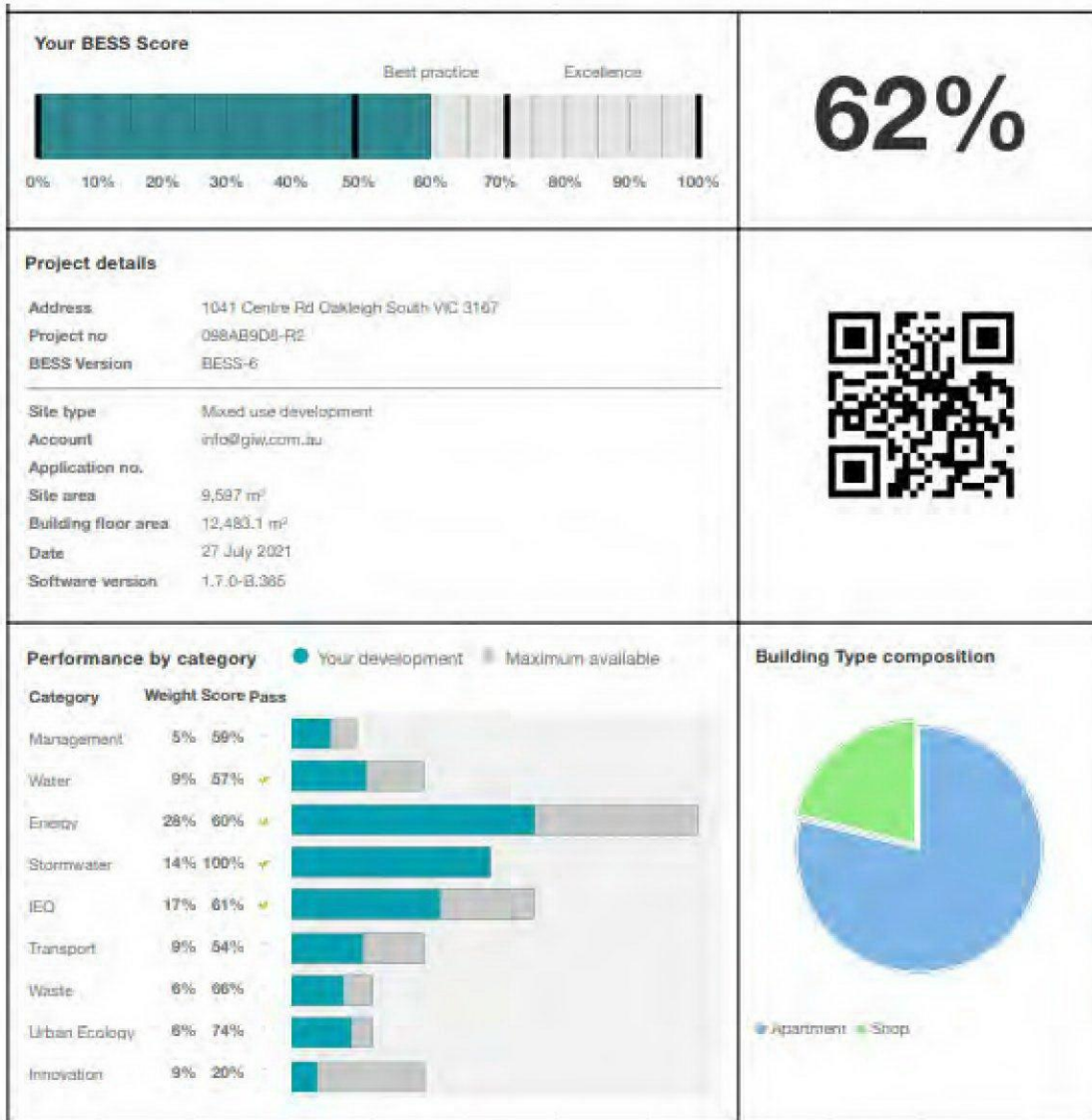
Annual Demand Class 2 Non-Residential Areas	113,383 kWh/year
Annual Demand Carpark / Services	267,964 kWh/year
Total Annual Demand	381,348 kWh/year

#### Demand / Supply

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Contribution Solar PV to Communal Area Power 8%

Appendix D: BESS Assessment



## Buildings

Name	Height	Footprint	% of total footprint
1042 Centre Rd	8	15,833 m <sup>2</sup>	100%

## Dwellings & Non Res Spaces

### Dwellings

Name	Quantity	Area	Building	% of total area
<b>Apartment</b>				
1B Apartments	112	51.1 m <sup>2</sup>	1042 Centre Rd	45%
2B Apartments	54	70.0 m <sup>2</sup>	1042 Centre Rd	30%
Studio	7	48.7 m <sup>2</sup>	1042 Centre Rd	2%
<b>Total</b>	<b>173</b>	<b>9,844 m<sup>2</sup></b>	<b>78%</b>	

### Non-Res Spaces

Name	Quantity	Area	Building	% of total area
<b>Shop</b>				
Supermarket	1	1,719 m <sup>2</sup>	1042 Centre Rd	13%
Retail	1	786 m <sup>2</sup>	1042 Centre Rd	6%
Cafe	1	134 m <sup>2</sup>	1042 Centre Rd	1%
<b>Total</b>	<b>3</b>	<b>2,639 m<sup>2</sup></b>	<b>21%</b>	

## Supporting information

### Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.1	Individual utility meters annotated		-
Management 3.2	Individual utility meters annotated		-
Management 3.3	Common area submeters annotated		-
Water 3.1	Water efficient garden annotated		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Floor plans showing location of photovoltaic panels as described.		-
Stormwater 1.1	Location of any stormwater management systems used in STORM or MUSIC modelling (e.g. Rainwater tanks, raingarden, buffer strips)		-
IEQ 1.1	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.2	If using BESS daylight calculator, references to floorplans and elevations showing window sizes and sky angles.		-
IEQ 1.5	Floor plans with compliant bedrooms marked		-
Transport 1.1	All nominated residential bicycle parking spaces		-
Transport 1.5	All nominated non-residential visitor bicycle parking spaces		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Transport 2.2	Location of car share parking space		-
Waste 2.1	Location of food and garden waste facilities		-

Credit	Requirement	Response	Status
Waste 2.2	Location of recycling facilities		-
Urban Ecology 1.1	Size and location of communal spaces		-
Urban Ecology 2.1	Vegetated areas		-
Urban Ecology 2.2	Green roof		-
Urban Ecology 2.4	Taps and floor waste on balconies / courtyards		-

### Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Management 2.3	Preliminary modelling report		-
Management 2.3a	Section J glazing assessment		-
Energy 1.1	Energy Report showing calculations of reference case and proposed buildings		-
Energy 3.1	Provide a written explanation of either the fully natural carpark ventilation or carbon monoxide monitoring, describing how these systems will work, what systems are required for them to be fully integrated and who will be responsible for their implementation throughout the design, procurement and operational phases of the building life.		-
Energy 3.6	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Energy 3.7	Provide a written description of the average lighting power density to be installed in the development and specify the lighting type(s) to be used.		-
Energy 4.2	Specifications of the solar photovoltaic system(s).		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.1	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.4	A short report detailing assumptions used and results achieved.		-
IEQ 1.5	A list of compliant bedrooms		-

### Credit summary

#### Management Overall contribution 4.5%

		59%
1.1 Pre-Application Meeting		0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
2.3 Thermal Performance Modelling - Non-Residential		50%
3.1 Metering		100%
3.2 Metering		100%
3.3 Metering		100%
4.1 Building Users Guide		100%

**Water Overall contribution 9.0%**

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

**Energy Overall contribution 27.5%**

		<b>Minimum required 50%</b>	<b>60%</b>	<b>✔ Pass</b>
1.1 Thermal Performance Rating - Non-Residential			37%	
1.2 Thermal Performance Rating - Residential			50%	
2.1 Greenhouse Gas Emissions			100%	
2.2 Peak Demand			21%	
2.3 Electricity Consumption			100%	
2.4 Gas Consumption			21%	
3.1 Carpark Ventilation			100%	
3.2 Hot Water			21%	
3.4 Clothes Drying			0%	
3.6 Internal Lighting - Residential Multiple Dwellings			100%	
3.7 Internal Lighting - Non-Residential			100%	
4.1 Combined Heat and Power (cogeneration / trigeneration)			N/A	✦ Scoped Out
No cogeneration or trigeneration system in use.				
4.2 Renewable Energy Systems - Solar			100%	
4.4 Renewable Energy Systems - Other			N/A	⊘ Disabled
No other (non-solar PV) renewable energy is in use.				

**Stormwater Overall contribution 13.5%**

		<b>Minimum required 100%</b>	<b>100%</b>	<b>✔ Pass</b>
1.1 Stormwater Treatment			100%	

**IEQ Overall contribution 16.5%**

		<b>Minimum required 50%</b>	<b>61%</b>	<b>✔ Pass</b>
1.1 Daylight Access - Living Areas			100%	
1.2 Daylight Access - Bedrooms			100%	
1.3 Winter Sunlight			0%	
1.4 Daylight Access - Non-Residential			34%	✔ Achieved
1.5 Daylight Access - Minimal Internal Bedrooms			100%	
2.1 Effective Natural Ventilation			0%	
2.3 Ventilation - Non-Residential			33%	✘ Not Achieved
3.4 Thermal comfort - Shading - Non-residential			100%	
3.5 Thermal Comfort - Ceiling Fans - Non-Residential			0%	
4.1 Air Quality - Non-Residential			100%	

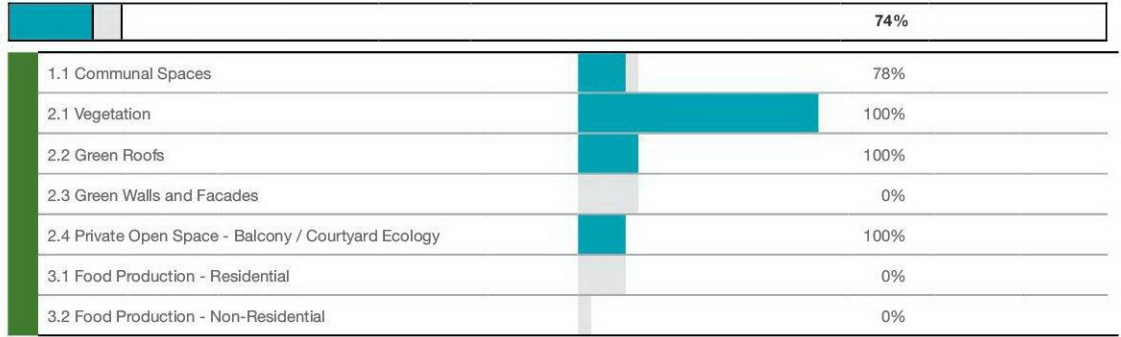
**Transport Overall contribution 9.0%**

			<b>54%</b>	
1.1 Bicycle Parking - Residential			100%	
1.2 Bicycle Parking - Residential Visitor			0%	
1.3 Bicycle Parking - Convenience Residential			0%	
1.4 Bicycle Parking - Non-Residential			0%	
1.5 Bicycle Parking - Non-Residential Visitor			100%	
1.6 End of Trip Facilities - Non-Residential			N/A	⊘ Disabled
Credit 1.4 must be complete first.				
2.1 Electric Vehicle Infrastructure			100%	
2.2 Car Share Scheme			100%	
2.3 Motorbikes / Mopeds			0%	

**Waste Overall contribution 5.5%**

			<b>66%</b>	
1.1 - Construction Waste - Building Re-Use			0%	
2.1 - Operational Waste - Food & Garden Waste			100%	
2.2 - Operational Waste - Convenience of Recycling			100%	

**Urban Ecology Overall contribution 5.5%**



**Innovation Overall contribution 9.0%**



## Credit breakdown

### Management Overall contribution 3%

<b>1.1 Pre-Application Meeting</b>	0%
Score Contribution	This credit contributes 37.5% towards the category score.
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?
Question	Criteria Achieved ?
Project	No
<b>2.2 Thermal Performance Modelling - Multi-Dwelling Residential</b>	100%
Score Contribution	This credit contributes 19.7% towards the category score.
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?
Question	Criteria Achieved ?
Apartment	Yes
<b>2.3 Thermal Performance Modelling - Non-Residential</b>	50%
Score Contribution	This credit contributes 5.3% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?
Question	Criteria Achieved ?
Shop	Yes
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Shop	No
<b>3.1 Metering</b>	100%
Score Contribution	This credit contributes 9.9% towards the category score.
Criteria	Have utility meters been provided for all individual dwellings?
Question	Criteria Achieved ?
Apartment	Yes
<b>3.2 Metering</b>	100%
Score Contribution	This credit contributes 2.6% towards the category score.
Criteria	Have utility meters been provided for all individual commercial tenants?
Question	Criteria Achieved ?
Shop	Yes



**3.3 Metering**

100%

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Apartment	Yes
Shop	Yes

**4.1 Building Users Guide**

100%

Score Contribution	This credit contributes 12.5% towards the category score.
Criteria	Will a building users guide be produced and issued to occupants?
Question	Criteria Achieved ?
Project	Yes

**Water** Overall contribution 5% Minimum required 50%

<b>Water Approach</b>	
What approach do you want to use for Water?:	Use the built in calculation tools
<b>Project Water Profile Question</b>	
Do you have a reticulated third pipe or an on-site water recycling system?:	No
Are you installing a swimming pool?:	No
Are you installing a rainwater tank?:	Yes
<b>Water fixtures, fittings and connections</b>	
Building: All	1042 Centre Rd
Showerhead: All	4 Star WELS (>= 6.0 but <= 7.5)
Bath: All	Scope out
Kitchen Taps: All	>= 5 Star WELS rating
Bathroom Taps: All	>= 5 Star WELS rating
Dishwashers:	
1B Apartments	>= 5 Star WELS rating
2B Apartments	
Studio	
Supermarket	Scope out
Retail	
Cafe	
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out
<b>Washing Machine Water Efficiency:</b>	
1B Apartments	Occupant to Install
2B Apartments	
Studio	
Supermarket	Scope out
Retail	
Cafe	
<b>Which non-potable water source is the dwelling/space connected to?:</b>	
1B Apartments	-1
2B Apartments	
Studio	
Supermarket	Tank 1
Retail	
Cafe	
<b>Non-potable water source connected to Toilets:</b>	
1B Apartments	No
2B Apartments	
Studio	
Supermarket	Yes
Retail	
Cafe	

Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No
<b>Rainwater Tank</b>	
What is the total roof area connected to the rainwater tank?: Tank 1	1,977 m <sup>2</sup>
Tank Size: Tank 1	30,000 Litres
Irrigation area connected to tank: Tank 1	-
Is connected irrigation area a water efficient garden?: Tank 1	-
Other external water demand connected to tank?: Tank 1	-
<b>1.1 Potable water use reduction</b>	40%
Score Contribution	This credit contributes 71.4% towards the category score.
Criteria	What is the reduction in total potable water use due to efficient fixtures, appliances, rainwater use and recycled water use? To achieve points in this credit there must be >25% potable water reduction.
Output	Reference
Project	20773 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	16340 kL
Output	Proposed (including rainwater and recycled water use)
Project	15545 kL
Output	% Reduction in Potable Water Consumption
Project	25 %
Output	% of connected demand met by rainwater
Project	100 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	8533 kL
<b>3.1 Water Efficient Landscaping</b>	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes
<b>4.1 Building Systems Water Use Reduction</b>	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Where applicable, have measures been taken to reduce potable water consumption by >80% in the buildings air-conditioning chillers and when testing fire safety systems?
Question	Criteria Achieved ?
Project	Yes

**Energy** Overall contribution 17% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	Yes
Do all exposed floors and ceilings (forming part of the envelope) demonstrate a minimum 10% improvement in required NCC2019 insulation levels (total R-value upwards and downwards)?:	Yes
Does all wall and glazing demonstrate meeting the required NCC2019 facade calculator (or better than the total allowance)?:	Yes
Are heating and cooling systems within one Star of the most efficient equivalent capacity unit available, or Coefficient of Performance (CoP) & Energy Efficiency Ratios (EER) not less than 85% of the CoP & EER of the most efficient equivalent capacity unit available?:	Yes
Are water heating systems within one star of the best available, or 85% or better than the most efficient equivalent capacity unit?:	Yes
<b>Dwellings Energy Approach</b>	
What approach do you want to use for Energy?:	Use the built in calculation tools
<b>Project Energy Profile Question</b>	
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Gas supplied into building:	Natural Gas
Are you installing a cogeneration or trigeneration system?:	No
<b>Dwelling Energy Profiles</b>	
Building: All	1042 Centre Rd
Below the floor is: All	Another Occupancy
Above the ceiling is: All	Another Occupancy
Exposed sides: All	1
NatHERS Annual Energy Loads - Heat: All	62.4 MJ/sqm
NatHERS Annual Energy Loads - Cool: All	16.3 MJ/sqm
NatHERS star rating: All	7.0
Type of Heating System: All	D Reverse cycle space
Heating System Efficiency: All	3 Star
Type of Cooling System: All	Refrigerative space
Cooling System Efficiency: All	3 Stars
Type of Hot Water System: All	G Gas Storage 6 star
Is the hot water system shared by multiple dwellings?: All	Yes
% Contribution from solar hot water system: All	0 %
Clothes Line: All	A No drying facilities
Clothes Dryer: All	Occupant to Install
<b>Non-Residential Building Energy Profile</b>	
Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	

Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	-
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	-
Heating - Gas - reference fabric and reference services:	-
Heating - Gas - proposed fabric and reference services:	-
Heating - Gas - proposed fabric and proposed services:	-
Heating - Wood - reference fabric and reference services:	-
Heating - Wood - proposed fabric and reference services:	-
Heating - Wood - proposed fabric and proposed services:	-
Hot Water - Electricity - Baseline:	-
Hot Water - Electricity - Proposed:	-
Hot Water - Gas - Baseline:	-
Hot Water - Gas - Proposed:	-
Lighting - Baseline:	-
Lighting - Proposed:	-
Peak Thermal Cooling Load - Baseline:	-
Peak Thermal Cooling Load - Proposed:	-
<b>Solar Photovoltaic systems</b>	
System Size (lesser of inverter and panel capacity):	
PV 1	75.0 kW peak
PV 2	25.0 kW peak
Orientation (which way is the system facing)?:	
PV 1	North
PV 2	North
Inclination (angle from horizontal):	
PV 1	30.0 Angle (degrees)
PV 2	30.0 Angle (degrees)
Which Building Class does this apply to?:	
PV 1	Apartment
PV 2	Shop
<b>1.1 Thermal Performance Rating - Non-Residential</b>	<b>37%</b>
Score Contribution	This credit contributes 8.0% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
<b>1.2 Thermal Performance Rating - Residential</b>	<b>50%</b>
Score Contribution	This credit contributes 22.3% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Apartment	7.0 Stars

<b>2.1 Greenhouse Gas Emissions</b>	100%
Score Contribution	This credit contributes 9.4% towards the category score.
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?
Output	Reference Building with Reference Services (BCA only)
Apartment	607,317 kg CO2
Output	Proposed Building with Proposed Services (Actual Building)
Apartment	300,722 kg CO2
Output	% Reduction in GHG Emissions
Apartment	50 %
<b>2.2 Peak Demand</b>	21%
Score Contribution	This credit contributes 4.7% towards the category score.
Criteria	What is the % reduction in instantaneous (peak-hour) demand against the benchmark?
Output	Peak Thermal Cooling Load - Baseline
Apartment	2,534 kW
Output	Peak Thermal Cooling Load - Proposed
Apartment	2,270 kW
Output	Peak Thermal Cooling Load - % Reduction
Apartment	10 %
<b>2.3 Electricity Consumption</b>	100%
Score Contribution	This credit contributes 9.4% towards the category score.
Criteria	What is the % reduction in annual electricity consumption against the benchmark?
Output	Reference
Apartment	494,168 kWh
Output	Proposed
Apartment	186,473 kWh
Output	Improvement
Apartment	62 %
<b>2.4 Gas Consumption</b>	21%
Score Contribution	This credit contributes 9.4% towards the category score.
Criteria	What is the % reduction in annual gas consumption against the benchmark?
Output	Reference
Apartment	2,009,058 MJ
Output	Proposed
Apartment	2,150,184 MJ
Output	Improvement
Apartment	-8 %

<b>3.1 Carpark Ventilation</b>	100%
Score Contribution	This credit contributes 9.4% towards the category score.
Criteria	If you have an enclosed carpark, is it: (a) fully naturally ventilated (no mechanical ventilation system) or (b) 40 car spaces or less with Carbon Monoxide monitoring to control the operation and speed of the ventilation fans?
Question	Criteria Achieved ?
Project	Yes
<b>3.2 Hot Water</b>	21%
Score Contribution	This credit contributes 4.7% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
Output	Reference
Apartment	558,072 kWh
Output	Proposed
Apartment	613,173 kWh
Output	Improvement
Apartment	-10 %
<b>3.4 Clothes Drying</b>	0%
Score Contribution	This credit contributes 3.7% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?
Output	Reference
Apartment	67,012 kWh
Output	Proposed
Apartment	67,012 kWh
Output	Improvement
Apartment	0 %
<b>3.6 Internal Lighting - Residential Multiple Dwellings</b>	100%
Score Contribution	This credit contributes 7.4% towards the category score.
Criteria	Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by Table J6.2a of the NCC 2019 Vol 1 (Class 2-9) and Clause 3.12.5.5 NCC 2019 Vol 2 (Class 1 & 10)?
Question	Criteria Achieved ?
Apartment	Yes
<b>3.7 Internal Lighting - Non-Residential</b>	100%
Score Contribution	This credit contributes 2.0% towards the category score.
Criteria	Does the maximum illumination power density (W/m2) in at least 90% of the area of the relevant building class meet the requirements in Table J6.2a of the NCC 2019 Vol 1?
Question	Criteria Achieved ?
Shop	Yes

<b>4.1 Combined Heat and Power (cogeneration / trigeneration)</b>		N/A	✦ Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.		
<b>4.2 Renewable Energy Systems - Solar</b>		100%	
Score Contribution	This credit contributes 4.7% towards the category score.		
Criteria	What % of the estimated energy consumption of the building class it supplies does the solar power system provide?		
Output	Solar Power - Energy Generation per year		
Apartment	97,729 kWh		
Shop	32,576 kWh		
Output	% of Building's Energy		
Apartment	12 %		
Shop	10 %		
<b>4.4 Renewable Energy Systems - Other</b>		N/A	⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

## Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:		Melbourne Water STORM tool
<b>1.1 Stormwater Treatment</b>		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	103	
Output	Min STORM Score	
Project	100	



IEQ Overall contribution 10% Minimum required 50%

**IEQ DTS**

Use the BESS Deemed to Satisfy (Dts) method for IEQ?: No

**Dwellings IEQ Approach**

What approach do you want to use for dwellings?: Use the built in calculation tools

**Dwelling Daylight Room Profile Questions****Room Designation:**

1B W L1-3 Living

1B W L4-7

1B N, E, S L1-7

2B2B E

2B2B S

2B1B S

2B2B NE

Studio

All bedrooms Bedroom

**Quantity:**

1B W L1-3 18

1B W L4-7 24

1B N, E, S L1-7 70

2B2B E 12

All bedrooms 229

2B2B S 14

2B1B S

2B2B NE

Studio 7

**Auto-Pass:**

1B W L1-3 Yes

1B N, E, S L1-7

All bedrooms

Studio

1B W L4-7 No

2B2B E

2B2B S

2B1B S

2B2B NE

**Room Floor Area:**

1B W L1-3 -

1B N, E, S L1-7

All bedrooms

Studio

1B W L4-7 23.0 m<sup>2</sup>2B2B E 32.0 m<sup>2</sup>

2B2B S

2B1B S 31.0 m<sup>2</sup>2B2B NE 30.0 m<sup>2</sup>

<b>Vertical Angle:</b>	
1B W L1-3 1B N, E, S L1-7 All bedrooms Studio	-
1B W L4-7	32.0 Angle (degrees)
2B2B E 2B2B S 2B1B S 2B2B NE	90.0 Angle (degrees)
<b>Horizontal Angle:</b>	
1B W L1-3 1B N, E, S L1-7 All bedrooms Studio	-
1B W L4-7	73.0 Angle (degrees)
2B2B E 2B2B S 2B1B S	180 Angle (degrees)
2B2B NE	115 Angle (degrees)
<b>Window Area:</b>	
1B W L1-3 1B N, E, S L1-7 All bedrooms Studio	-
1B W L4-7	7.0 m <sup>2</sup>
2B2B E 2B2B S 2B1B S 2B2B NE	9.2 m <sup>2</sup>
<b>Window Orientation:</b>	
1B W L1-3 1B N, E, S L1-7 All bedrooms Studio	-
1B W L4-7	West
2B2B E	East
2B2B S 2B1B S	South
2B2B NE	North-East

<b>Glass Type:</b>	
1B W L1-3	-
1B N, E, S L1-7	
All bedrooms	
Studio	
1B W L4-7	Clear Low-E Double (VLT 0.73)
2B2B E	
2B2B S	
2B1B S	
2B2B NE	
<b>Daylight Criteria Achieved?: All</b>	Yes
<b>1.1 Daylight Access - Living Areas</b>	100%
Score Contribution	This credit contributes 18.1% towards the category score.
Criteria	What % of living areas achieve a daylight factor greater than 1%
Output	Calculated percentage
Apartment	100 %
<b>1.2 Daylight Access - Bedrooms</b>	100%
Score Contribution	This credit contributes 18.1% towards the category score.
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%
Output	Calculated percentage
Apartment	100 %
<b>1.3 Winter Sunlight</b>	0%
Score Contribution	This credit contributes 6.0% towards the category score.
Criteria	Do 70% of dwellings receive at least 3 hours of direct sunlight in all Living areas between 9am and 3pm in mid-winter?
Question	Criteria Achieved ?
Apartment	No
<b>1.4 Daylight Access - Non-Residential</b>	34% <span style="color: green;">✔</span> Achieved
Score Contribution	This credit contributes 9.7% towards the category score.
Criteria	What % of the regular use floor areas have at least 2% daylight factor?
Question	Percentage Achieved?
Shop	34 %
<b>1.5 Daylight Access - Minimal Internal Bedrooms</b>	100%
Score Contribution	This credit contributes 6.0% towards the category score.
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?
Question	Criteria Achieved ?
Apartment	Yes

<b>2.1 Effective Natural Ventilation</b>	0%
Score Contribution	This credit contributes 18.1% towards the category score.
Criteria	What % of dwellings are effectively naturally ventilated?
Question	Percentage Achieved?
Apartment	40 %
<b>2.3 Ventilation - Non-Residential</b>	33% <span style="color: red;">✘</span> Not Achieved
Score Contribution	This credit contributes 9.7% towards the category score.
Criteria	What % of the regular use areas are effectively naturally ventilated?
Question	Percentage Achieved?
Shop	0 %
Criteria	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668.2:2012?
Question	What increase in outdoor air is available to regular use areas compared to the minimum required by AS 1668:2012?
Shop	50 %
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?
Question	Value
Shop	-
<b>3.4 Thermal comfort - Shading - Non-residential</b>	100%
Score Contribution	This credit contributes 4.9% towards the category score.
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Shop	100 %
<b>3.5 Thermal Comfort - Ceiling Fans - Non-Residential</b>	0%
Score Contribution	This credit contributes 1.6% towards the category score.
Criteria	What percentage of regular use areas in tenancies have ceiling fans?
Question	Percentage Achieved?
Shop	0 %
<b>4.1 Air Quality - Non-Residential</b>	100%
Score Contribution	This credit contributes 7.7% towards the category score.
Criteria	Do all paints, sealants and adhesives meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	Yes
Criteria	Does all carpet meet the maximum total indoor pollutant emission limits?
Question	Criteria Achieved ?
Project	No carpet

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

**Transport** Overall contribution 5%

<b>1.1 Bicycle Parking - Residential</b>		100%
Score Contribution	This credit contributes 17.9% towards the category score.	
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?	
Question	Bicycle Spaces Provided ?	
Apartment	174	
Output	Min Bicycle Spaces Required	
Apartment	173	
<b>1.2 Bicycle Parking - Residential Visitor</b>		0%
Score Contribution	This credit contributes 17.9% towards the category score.	
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?	
Question	Visitor Bicycle Spaces Provided ?	
Apartment	20	
Output	Min Visitor Bicycle Spaces Required	
Apartment	35	
<b>1.3 Bicycle Parking - Convenience Residential</b>		0%
Score Contribution	This credit contributes 9.0% towards the category score.	
Criteria	Are bike parking facilities for residents located at ground level?	
Question	Criteria Achieved ?	
Apartment	No	
<b>1.4 Bicycle Parking - Non-Residential</b>		0%
Score Contribution	This credit contributes 4.8% towards the category score.	
Criteria	Have the planning scheme requirements for employee bicycle parking been exceeded by at least 50% (or a minimum of 2 where there is no planning scheme requirement)?	
Question	Criteria Achieved ?	
Shop	No	
Question	Bicycle Spaces Provided ?	
Shop	0	
<b>1.5 Bicycle Parking - Non-Residential Visitor</b>		100%
Score Contribution	This credit contributes 2.4% towards the category score.	
Criteria	Have the planning scheme requirements for visitor bicycle parking been exceeded by at least 50% (or a minimum of 1 where there is no planning scheme requirement)?	
Question	Criteria Achieved ?	
Shop	Yes	
Question	Bicycle Spaces Provided ?	
Shop	18	
<b>1.6 End of Trip Facilities - Non-Residential</b>	N/A	<input checked="" type="checkbox"/> Disabled
This credit is disabled	Credit 1.4 must be complete first.	

<b>2.1 Electric Vehicle Infrastructure</b>	100%
Score Contribution	This credit contributes 22.8% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes
<b>2.2 Car Share Scheme</b>	100%
Score Contribution	This credit contributes 11.4% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	Yes
<b>2.3 Motorbikes / Mopeds</b>	0%
Score Contribution	This credit contributes 11.4% towards the category score.
Criteria	Are a minimum of 5% of vehicle parking spaces designed and labelled for motorbikes (must be at least 5 motorbike spaces)?
Question	Criteria Achieved ?
Project	No

## Waste Overall contribution 4%

<b>1.1 - Construction Waste - Building Re-Use</b>	0%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	No
<b>2.1 - Operational Waste - Food &amp; Garden Waste</b>	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	Yes
<b>2.2 - Operational Waste - Convenience of Recycling</b>	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

**Urban Ecology** Overall contribution 4%

<b>1.1 Communal Spaces</b>	78%
Score Contribution	This credit contributes 11.4% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m <sup>2</sup> for each of the first 50 occupants * Additional 0.5m <sup>2</sup> for each occupant between 51 and 250 * Additional 0.25m <sup>2</sup> for each occupant above 251?
Question	Common space provided
Apartment	2,210 m <sup>2</sup>
Shop	-
Output	Minimum Common Space Required
Apartment	204 m <sup>2</sup>
Shop	203 m <sup>2</sup>
<b>2.1 Vegetation</b>	100%
Score Contribution	This credit contributes 45.5% towards the category score.
Criteria	How much of the site is covered with vegetation, expressed as a percentage of the total site area?
Question	Percentage Achieved ?
Project	36 %
<b>2.2 Green Roofs</b>	100%
Score Contribution	This credit contributes 11.4% towards the category score.
Criteria	Does the development incorporate a green roof?
Question	Criteria Achieved ?
Project	Yes
<b>2.3 Green Walls and Facades</b>	0%
Score Contribution	This credit contributes 11.4% towards the category score.
Criteria	Does the development incorporate a green wall or green façade?
Question	Criteria Achieved ?
Project	No
<b>2.4 Private Open Space - Balcony / Courtyard Ecology</b>	100%
Score Contribution	This credit contributes 9.0% towards the category score.
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?
Question	Criteria Achieved ?
Apartment	Yes



<b>3.1 Food Production - Residential</b>		0%
Score Contribution	This credit contributes 9.0% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Apartment	22.0 m <sup>2</sup>	
Output	Min Food Production Area	
Apartment	68 m <sup>2</sup>	
<b>3.2 Food Production - Non-Residential</b>		0%
Score Contribution	This credit contributes 2.4% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Shop	0.0 m <sup>2</sup>	
Output	Min Food Production Area	
Shop	66 m <sup>2</sup>	

## Innovation Overall contribution 2%

<b>Innovations</b>		
<b>Description:</b>		
Future Provision Battery Storage	Future spatial provision for battery storage will be incorporated into the design.	
100kW Solar PV system	A 100kW Solar PV system is to be located on the roof of the proposed development. The system is expected to generate approximately 144,162kWh and will be connected to an embedded network serving the development.	
<b>Points Targeted:</b>		
Future Provision Battery Storage	1	
100kW Solar PV system	1	
<b>1.1 Innovation</b>		20%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

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