

ADVERTISED COPY

SUSTAINABLE MANAGEMENT PLAN



PROPOSED RETIREMENT LIVING VILLAGE

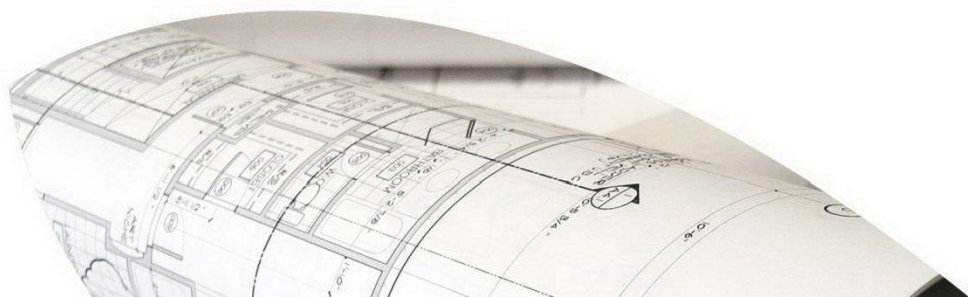
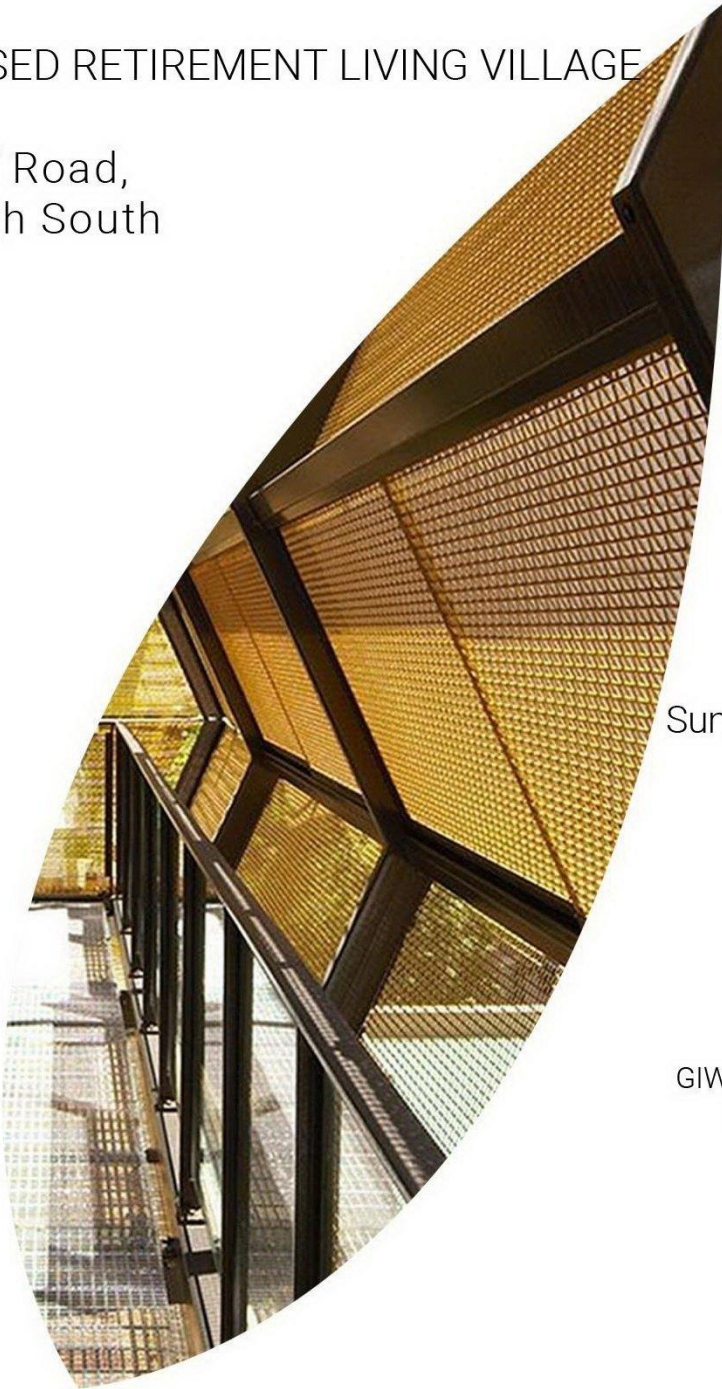
52 Golf Road,
Oakleigh South

GIW22017
Revision C

Prepared for:
Summerset Villages (Number
3) Pty Ltd

19 December 2022

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Limitations

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Revision History

Revision Number	Date Issued	Author	Approved	Comments
A	10/11/2022	KE	IB	Draft
B	12/12/2022	KE	IB	Final – DP Submission
C	19/12/2022	KE	IB	Final – DP Submission

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1. Introduction

Project Information

GIW Environmental Solutions Pty Ltd ("GIW") has been engaged by Summerset Villages (Number 3) Pty Ltd to provide Environmentally Sustainable Design (ESD) consulting services for the retirement living village at 52 Golf Road, Oakleigh South.

The indicative village will include 41 independent living apartments (ILA), 50 villas, 18 residential aged care suites (RAC) and 26 assisted living apartments (ALA), ground floor amenities including arts and crafts areas, food and beverage, studio, gym, hair salon, libraries, lounges, private dining, theatre, and wellness centre constructed over 3 levels plus basement carpark and will consist of the following:

- 6 x 1-bedroom apartments
- 24 x 2-bedroom apartments
- 11 x 3-bedroom apartments
- 38 x 2-bedroom villas
- 12 x 3-bedroom villas
- 18 x RAC suites
- 26 x ALA suites
- 773m² of ground floor amenities

The site located at 52 Golf Road, Oakleigh South has an approximate surface area of 18,257m² and is currently undeveloped. Distance from the site to Melbourne CBD is approximately 21km.

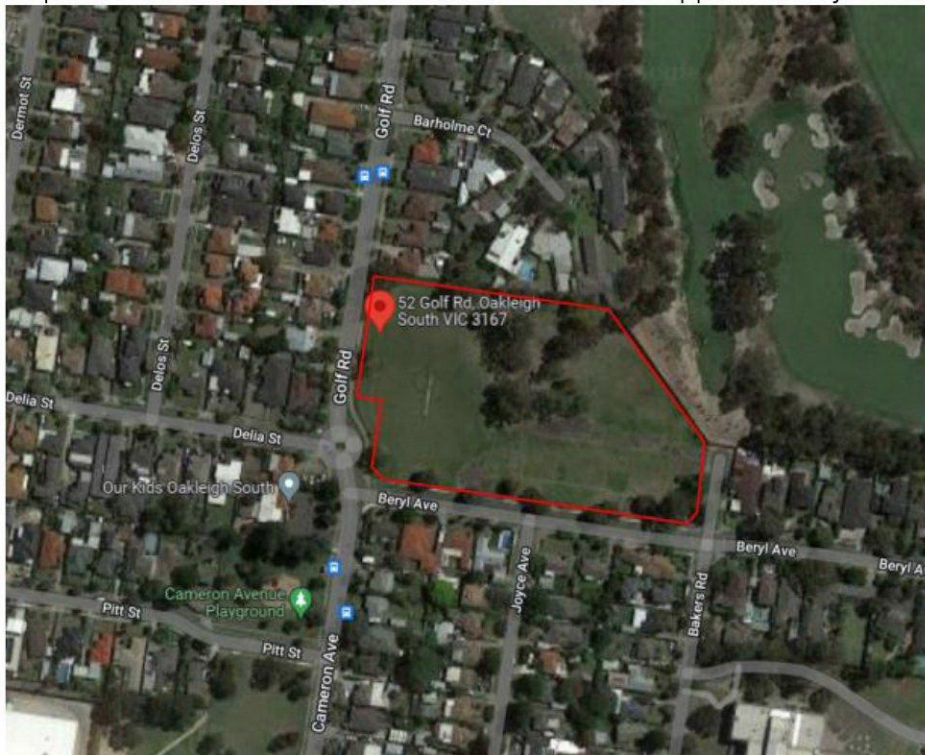


Figure 1 - Pre-existing site at 52 Golf Road, Oakleigh South.

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.

Development Type	Application Requirement	Example Tools
<ul style="list-style-type: none"> Development of 10 or more dwellings. Development of a building for accommodation other than dwellings with a gross floor area of more than 1000m². 	Sustainability Management Plan (SMP)	BESS Green Star MUSIC STORM

Further to the above, this SMP also responds to Victoria Planning Provisions VC216 – 15.01-2S.

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)

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

Summerset Villages (Number 3) Pty Ltd 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:

- Fender Katsalidis – Project No. 22035 – Drawing No. DP01a, DP099a, DP100a – DP103a, DP200 – DP207 Dated 09/12/2022
- 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
- Stormwater Management Plan by Colliers – Revision B dated December 2022.
- Draft Summerset Australia Metering Strategy by Summerset Management Group Australia Pty Ltd – Revision 7 dated 26th September 2022.

2. ESD Summary

The indicative retirement village at 52 Golf Road, Oakleigh South will implement the following ESD initiatives. The results of this assessment as outlined are indicative and subject to alteration during the town planning application process.

1. The project will aim to achieve a total BESS score of 64% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%.
2. 41% (17 out of 41) of the village's ILAs are naturally cross-ventilated.
100% (50 out of 50) of the village's villas are naturally cross-ventilated.
3. The aged care and communal facilities are targeting a 2% DF to 75% of the nominated area.
4. Daylight modelling has been conducted for a representative sample of ILAs. The summary result is as follows:

% of living floor area above DF 1.0	% of bedroom floor area above DF 0.5
80	84

5. 34% (14 out of 41) of ILA's achieve at least 3 hours of sunlight.
6. The village will aim to provide a comprehensive shading strategy.
7. The village will aim to achieve a 7 Star average NatHERS Energy Rating result.
8. The aged care and communal facilities will meet the heating and cooling energy consumption requirements for BCA Section J 2019.
9. The village will endeavour to utilise electric storage hot water systems.
10. It is recommended that a total 60kW Solar PV system is to be located on the roof of the proposed village.
11. Electricity, cold water, or hot water metering is to be provided as per the draft Summerset Australia Metering Strategy.
12. Water efficient fittings and fixtures are applied throughout.
13. A 20,000-litre rainwater tank will harvest rainwater from the ILA building roof. This tank will be connected to the apartment building WC's and landscape irrigation to the grounds around the building.
14. A 20,000-litre rainwater tank will harvest rainwater from the ALA and RAC building roof. This tank will be connected to the building central laundry and landscape irrigation to the grounds around the building.
15. A compliant MUSIC model has been undertaken by Colliers.
16. The majority of landscaping to be native vegetation and water efficient drip irrigation will be provided.
17. 10 bicycle spaces are to be provided for residents.
18. 15 bicycle spaces are to be provided for residential visitors and 3 for aged care visitors.
19. A minimum of 212m² of communal space will be provided throughout the site.
20. The development will seek to introduce a min. 111m² of communal food production area, subject to design development during the town planning application permit.

3. BESS Performance

The project will aim to achieve a total BESS score of 64% 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.

<p>Your BESS Score</p> <p>0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%</p>	<p>64%</p>
<p>Project details</p> <p>Address: 52 Golf Rd Oakleigh South VIC 3167 Project no: C7A9F8E9-R2 BESS Version: BESS-6</p> <hr/> <p>Site type: Mixed use development Account: info@giv.com.au Application no.: Site area: 18,257.00 m² Building floor area: 13,099.80 m² Date: 19 December 2022 Software version: 1.7.1-B.393</p>	

Performance by category

● Your development ● Maximum available

Category	Weight	Score	Pass
Management	5%	100%	*
Water	9%	57%	✓
Energy	28%	59%	✓
Stormwater	14%	100%	✓
IEQ	17%	62%	✓
Transport	9%	49%	*
Waste	6%	100%	*
Urban Ecology	6%	68%	*
Innovation	9%	10%	*

4. ESD Assessment

Management

Council ESD objectives:

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

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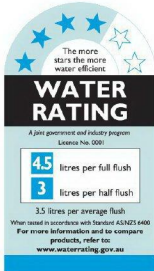


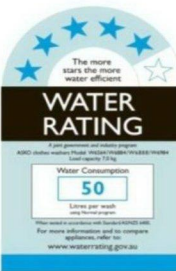
Criteria	Construction and Building Management Actions	
Pre-Application Meeting	To ensure appropriate sustainable design principles and strategies are considered from the preliminary design stage of each development.	GIW will endeavour to be involved in a town planning pre-application meeting with Council.
Metering	To provide building users with information that allows monitoring of energy and water consumption	Electricity, cold water, or hot water metering is to be provided as per the draft Summerset Australia Metering Strategy.
Building User's Guide	To encourage and recognise initiatives that will help building users to use the building more efficiently.	<p>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:</p> <ul style="list-style-type: none"> • Energy and Environmental Strategy • Monitoring and Targeting • Building Services • Transport Facilities • Materials and Waste Policy • Expansion/Re-fit Considerations • References and Further Information

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		<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>WELS 4 Star - Toilets</p>  </div> <div style="text-align: center;"> <p>WELS 5 Star - Taps</p>  </div> <div style="text-align: center;"> <p>WELS 4 Star - Showerhead</p>  </div> <div style="text-align: center;"> <p>WELS 5 Star - Dishwasher</p>  </div> </div>
Rainwater Collection & Reuse	To reduce total potable water use due through the use of efficient fixtures, appliances, and the use of rainwater.	<p>A 20,000-litre rainwater tank will harvest rainwater from the ILA building roof. This tank will be connected to the apartment building WC's and landscape irrigation to the grounds around the building. It is estimated that this will save more than 279.7kL of potable water every year and meet 79.5% of the demand in these areas.</p> <p>A 20,000-litre rainwater tank will harvest rainwater from the ALA and RAC building roof. This tank will be connected to the building central laundry and landscape irrigation to the grounds around the building. It is estimated that this will save more than 279kL of potable water every year and meet 70.3% 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	The majority of landscaping to be native vegetation and water efficient drip irrigation will be provided.

Council Best Practice Standard

Criteria	Development Provision	
	<p>through encouraging water efficient landscape design.</p>	
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>>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 village will aim to incorporate air-cooled HVAC systems for both the residential, aged care and areas.</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																																																						
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.	<p>The National Construction Code (NCC) Class 2 – Sole Occupancy Unit(s) (ILAs and villas) are to be designed in accordance with NCC Section J (2019) NatHERS requirements. The ILAs and villas will aim to achieve an average 7.0 Star rating, with no unit achieving below 5 Stars.</p> <p>Further to this no ILA or villa will exceed the maximum allowed cooling load of 21 MJ/m² (Climate Zone 62 Moorabbin) In accordance with BADS Standard B35.</p> <p>The apartments are currently achieving a 7.3 Star average. This represents >10% reduction compared to minimum NCC compliance benchmarks. The below sample ratings demonstrate the villages’ ability to achieve this average. Refer Appendix B for Preliminary FirstRate Certificates.</p>																																																						
	<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 colspan="6">Sample 1</td> </tr> <tr> <td>2B ILA - Ground Floor</td> <td>73.8</td> <td>70.5</td> <td>3.3</td> <td>69.6</td> <td>7.5</td> </tr> <tr> <td colspan="6">Sample 2</td> </tr> <tr> <td>3BR Villa - Second Floor</td> <td>75.9</td> <td>55.1</td> <td>20.8</td> <td>102.3</td> <td>7.4</td> </tr> <tr> <td colspan="6">Sample 3</td> </tr> <tr> <td>2BR Villa - Ground Floor</td> <td>100.7</td> <td>93.4</td> <td>7.3</td> <td>68.7</td> <td>6.7</td> </tr> <tr> <td colspan="6">Sample 4</td> </tr> <tr> <td></td> <td>92.3</td> <td>79.8</td> <td>12.5</td> <td>94.0</td> <td>6.9</td> </tr> </tbody> </table>	Apartment No.	ACE Total MJ/M2	ACE Heating	ACE Cooling	ACE NCFA	Star Rating	Sample 1						2B ILA - Ground Floor	73.8	70.5	3.3	69.6	7.5	Sample 2						3BR Villa - Second Floor	75.9	55.1	20.8	102.3	7.4	Sample 3						2BR Villa - Ground Floor	100.7	93.4	7.3	68.7	6.7	Sample 4							92.3	79.8	12.5	94.0	6.9
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Council Best Practice Standard

Criteria	Development Provision				
3BR Villa - First Floor					
Sample 5					
2BR Villa - Ground Floor	65.3	46.9	18.4	74.8	7.8
Sample 6					
2BR Villa - Ground Floor	73.9	57.9	16.0	81.1	7.5
Sample 7					
3BR Villa - Ground Floor	73.4	60.3	13.1	99.2	7.5
Sample 8					
3BR ILA - First Floor	42.1	34.1	8	90.1	8.5
Sample 9					
2BR Villa - First Floor	84.7	63.9	20.8	76	7.2
Sample 10					
2BR Villa – First Floor	116.5	97	19.5	66.2	6.3
Average	79.9	65.9	14.0	82.2	7.3

*Dwellings are assessed using FirstRate5 v5.3.2a

Construction assumptions for preliminary FirstRate ratings are listed below. Note, these assumptions are based on the sample of ILAs, and villas assessed and may vary throughout the village. These assumptions are not to be relied upon for any other purpose beyond Development Plan assessment.

Element	Material	Insulation Value
Floor	Concrete Slab on Ground	R1.44
	Concrete Slab – where exposed below	R2.3

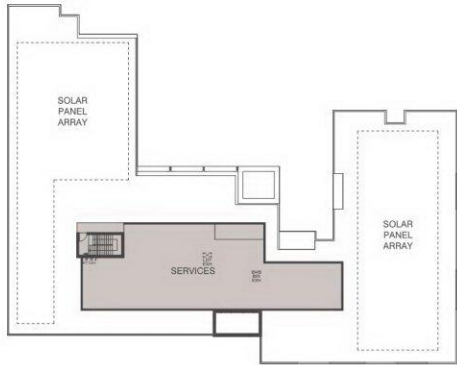
Council Best Practice Standard

Criteria	Development Provision	
	Lightweight Floor – where exposed below	R5.0
External Walls	Heavyweight	R2.7
Internal Walls	Plasterboard (where adjacent to unconditioned areas)	R2.7
Roof	Lightweight Metal Deck Roof	R5.0 R1.3 + R5.0
Fixed Windows	Aluminium frame, double glazed, argon filled, low-e, clear.	Total System U-Value: 2.71 Total System SHGC: 0.58 ±10%
Casement Doors	Aluminium frame, double glazed, argon filled, low-e, clear.	Total System U-Value: 3.6 Total System SHGC: 0.44 ±10%
Awning Windows	Aluminium frame, double glazed, argon filled, low-e, clear.	Total System U-Value: 4.42 Total System SHGC: 0.41±10%
Sliding Windows	Aluminium frame, double glazed, argon filled, low-e, clear.	Total System U-Value: 3.19 Total System SHGC: 0.48 ±10%
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 aged care and communal facilities will meet the heating and cooling energy consumption requirements for BCA Section J 2019. Refer Appendix C – Preliminary JV3 Energy Modelling.
HVAC System	To ensure the efficient use of energy and to	Where possible, inverter split systems are to be installed and sized to maintain conditions of the main living space of each ILA and villa. The efficiency of the air conditioning system is to be ≥3

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Criteria		Development Provision
	reduce consumption of electricity.	stars. Where applicable, VRV / VRF systems with a COP of 3.4 are to be installed to the aged care and communal facilities.
Lifts	To ensure energy efficient lifts are applied to the project.	Lifts are to incorporate the following energy efficiency measures where appropriate: <ul style="list-style-type: none"> • Switch off control devices for when lifts are not in use. • Efficient power supply unit. • LED lighting and displays. • Low-friction suspension.
Hot Water System	To ensure the efficient use of energy and to reduce consumption and greenhouse emissions from water heating.	The village will endeavour to utilise electric storage hot water systems.
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&M manual.</p>
Clothes Drying	Ensure the efficient use of energy and to reduce energy consumption and greenhouse emissions associated with clothes drying	Villas will be provided with outdoor clothes drying lines where possible.
Internal	To ensure the	The maximum illumination power density (W/sqm) is at least

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Criteria		Development Provision
Lighting - Residential	efficient use of energy, to reduce energy consumption, greenhouse emissions associated with artificial lighting, and to reduce energy peak demand.	<p>20% lower than NCC 2019 requirements.</p> <p>Lighting power density shall be as follows:</p> <ul style="list-style-type: none"> • Dwellings: No greater than average 4W/m² • POS: No greater than average 4W/m² • Back of house and indoor car parks: No greater than average 5W/m² <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	To ensure the efficient use of energy, to reduce energy consumption, greenhouse emissions associated with artificial lighting, and to reduce energy peak demand.	<p>The maximum illumination power density (W/m²) 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"> • Aged Care SOUs: No greater than average 5W/m² • Common Areas: No greater than average 4.5W/m² • Food and beverage: No greater than average 14W/m² • Library / Lounge areas: No greater than average 4.5W/m² • Kitchen and food preparation area: No greater than average 4W/m²
Renewable Energy Systems - Solar	To encourage on-site renewable energy generation and reduce greenhouse emissions.	<p>It is recommended that a total 60kW Solar PV system is to be located on the roof of the proposed village. A system of this size is expected to generate approximately 80,409kWh per annum.</p> <div style="text-align: center;">  <p>Indicative location Solar PV System</p> <p>Refer Appendix D – Renewable Energy</p> </div>

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
<p>Stormwater Treatment</p> <p>To minimise negative environmental impacts of stormwater runoff and maximise onsite re-use of stormwater.</p>	<p>The eWater - Model for Urban Stormwater Improvement Conceptualisation (MUSIC) tool will be 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.</p> <p>The MUSIC assessment by Colliers incorporates the following treatment strategies:</p> <ul style="list-style-type: none"> • It is recommended that rainwater is to be collected from apartment building roof and directed into the 20,000-litre rainwater tank. All apartment building WC's and landscape irrigation are to be connected to the rainwater tank. • It is recommended that rainwater is to be collected from RAC / ALA building roof and directed into the 20,000-litre rainwater tank. All laundries and landscape irrigation are to be connected to the rainwater tank. <p>A compliant MUSIC model has been provided by Colliers including the above rainwater tanks. Refer Stormwater Management Plan by Colliers Revision B dated December 2022.</p> <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.

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Criteria		Development Provision				
Daylight Access - Residential	To provide a high level of amenity and energy efficiency through design for natural light.	<p>Daylight modelling has been conducted for a representative sample of ILAs. The summary result is as follows:</p> <table border="1"> <thead> <tr> <th>% of living floor area above DF 1.0</th> <th>% of bedroom floor area above DF 0.5</th> </tr> </thead> <tbody> <tr> <td>80</td> <td>84</td> </tr> </tbody> </table> <p>Refer Appendix E - Daylight Modelling.</p>	% of living floor area above DF 1.0	% of bedroom floor area above DF 0.5	80	84
% of living floor area above DF 1.0	% of bedroom floor area above DF 0.5					
80	84					
Winter Sunlight	To provide a high level of amenity and reduce need for artificial heating in winter.	34% (14 out of 41) of ILA's 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 aged care and communal facilities are targeting a 2% DF to 75% of the nominated area. Refer Appendix E - Daylight Modelling.				
Minimal Internal Bedrooms	90% of bedrooms have an external window.	NIL internal bedrooms.				
Effective Natural Ventilation	To provide fresh air and passive cooling opportunities.	41% (17 out of 41) of the village's ILAs are naturally cross-ventilated. ILAs are provided with windows on opposite or adjacent facades or are effective single sided ventilated.				

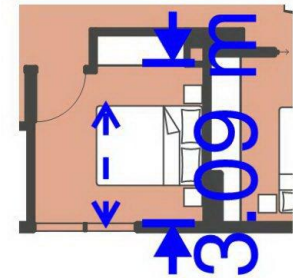
Council Best Practice Standard

Criteria

Development Provision

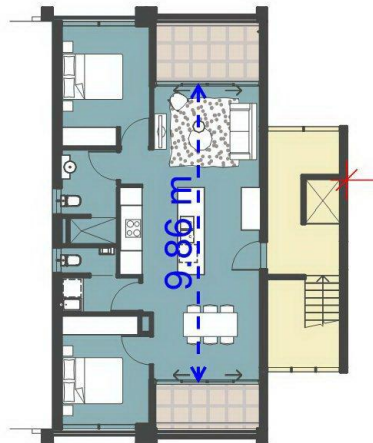


Typical natural cross-ventilated ILA

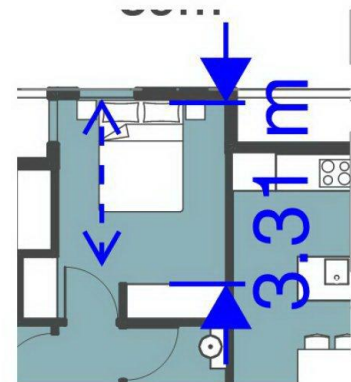


Typical single sided ventilated ILA bedroom

100% (50 out of 50) of the village's villas are naturally cross-ventilated. Villas are provided with windows on opposite or adjacent facades or are effective single sided ventilated.



Typical natural cross-ventilated villa



Typical single sided ventilated villa bedroom

Ventilation – Non-Residential

To provide fresh air and passive cooling opportunities.

It is intended that outdoor air rates for the aged care and communal facilities is to be 50% increased compared to AS 1668:2012. This is to be included in the mechanical design and specifications.

Thermal

To provide

The village will aim to provide a comprehensive shading strategy

Council Best Practice Standard

Criteria

Comfort

comfortable indoor spaces and reduce energy needed for heating and cooling.

Development Provision

through the below strategies, or an equivalent thereof:



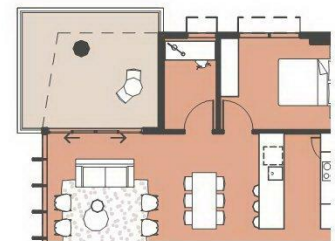
North facing ground floor villa windows are provided with a combination of eaves and pergola structures.



Level 1 north, west, and east facing villa windows are provided with roof overhangs.



Ground floor and level 1 apartment windows are shaded by apartment balcony and floors above.



North oriented apartment windows at Level 1 and 2 are provided with 500mm deep eaves.



East and west oriented apartment windows at level 1 and 2 are provided with min. 300mm vertical fins to each windowpane.

Council Best Practice Standard

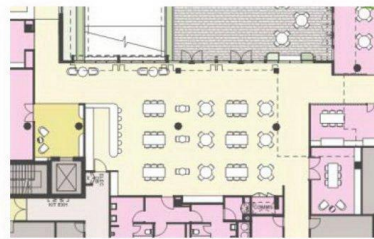
Criteria

Development Provision

The aged care and communal facilities are to be provided with a comprehensive shading strategy:

Thermal Comfort – Non-Residential

To provide comfortable indoor spaces and reduce energy needed for heating and cooling.



The main building north, west, and east windows are provided with a combination of overhangs and vertical fins.



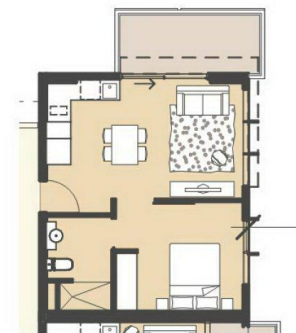
The main building east facing glazing at ground level is provided with a combination of overhangs and vertical fins.




North facing glazing to the RAC communal areas are shaded with balcony overhangs and window hoods.



The majority of level 1 RAC suite windows are shaded by the ALA balconies located above.



Council Best Practice Standard

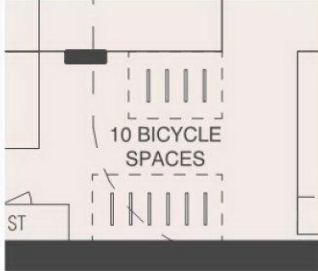


Criteria	Development Provision	
	<p>Level 1 ALA suites living room windows are shaded by level 2 ALA balconies.</p>  <p>Level 2 ALA suite living room windows are to be shaded by roof overhangs.</p>	<p>Majority of level 1 and 2 ALA suite windows oriented to the east and west are shaded by min. 300mm vertical fins.</p>
	<p>All paints and adhesives meet the maximum total indoor pollutant emission limits.</p>	<p>It is recommended that all internally applied paints adhesives and sealants are to have a low or ultra-low VOC content in line with Green Star Buildings V1 Credit 13.</p>
<p>Air Quality – Non-Residential</p>	<p>All carpet meets the maximum total indoor pollutant emission limits.</p>	<p>It is recommended that all internally applied carpets are to have a low VOC content in line with Green Star Buildings V1 Credit 13.</p>
	<p>All engineered wood meets the maximum total indoor pollutant emission limits.</p>	<p>It is recommended that all internally applied engineered wood products are to have low formaldehyde levels in line with Green Star Buildings V1 Credit 13.</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 & Residential Visitors</p> <p>To encourage and recognise initiatives that facilitate cycling.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>10 bicycle spaces are to be provided for residents at basement level.</p> </div> <div style="text-align: center;">  <p>15 bicycle spaces are to be provided for residential visitors.</p> </div> </div>
<p>Bicycle Parking – Non-Residential & Non-Residential Visitors</p> <p>To encourage and recognise initiatives that facilitate cycling.</p>	<div style="text-align: center;">  <p>In total 3 bicycle spaces are to be provided for aged care visitors. This represents a 50% increase over the planning scheme requirements.</p> </div>
<p>End of Trip Facilities – Non-Residential</p> <p>To minimise car dependency and to ensure that the built environment</p>	<p>The village will aim to provide an end of trip facility including a minimum of 1 shower, 2 lockers and changing facilities.</p>

Council Best Practice Standard

Criteria	Development Provision	
	is designed to promote the use of public transport, walking and cycling.	
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.	<p>A minimum of one charging point for electrical vehicles is integrated in the proposed village.</p> <p>The charging point will be provided within a visitor parking space/s to allow for use of all occupants and visitors.</p>
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.	N/A
Motorbikes / Mopeds	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 village will aim to incorporate min. 5 motorbike / moped / scooter spaces in the basement carpark. This represents $\geq 5\%$ of the total carparking.

Materials

ESD objectives:

- Use of low embodied energy materials.
- Encourage use of recycled and reusable materials in building construction and undertake adaptive reuse of buildings, where practical.

Council Best Practice Standard

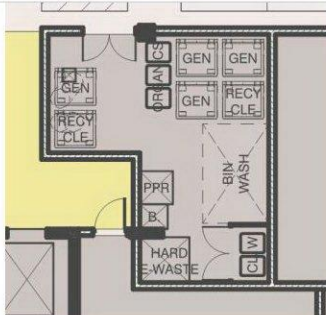
Criteria		Development Provision
Embodied Energy	Limited use of high embodied energy metals and materials, especially in a design with intended high churn (e.g. retail)	<p>The design will seek to limit the use of high embodied energy metal finishes.</p> <p>At least 40% of coarse aggregate in the concrete is crushed slag aggregate or other alternative materials (measured by mass across all concrete mixes in the project).</p>
Structural and Reinforcing Steel	Commitment to source structural and reinforcing steel from a responsible steel maker	<p>The building's steel (by mass) is to be sourced where possible from a Responsible Steel Maker with:</p> <ul style="list-style-type: none"> • a currently valid and certified ISO 14001 Environmental Management System (EMS) in place; and • is a member of the World Steel Association's (WSA) Climate Action Programme (CAP)
Sustainable Timber	Commitment to source timber from sustainably managed source, with proof of audit trail.	Where timber is to be used, such timbers are to accord with the GBCA's 'Essential' criteria for forest certification. This may include FSC and / or PEFC Certification which are both internationally recognised schemes ensuring that timber is sourced from sustainable sources. Alternatively, recycled timber will be used.
PVC	Commitment to source best practice PVC products	<p>Permanent formwork, pipes, flooring, blinds, and cables in the project will seek to comply with the following:</p> <ul style="list-style-type: none"> • Meet the GBCA's Best Practice Guidelines for PVC. or. • The supplier holds a valid ISO14001 certification.
Sustainable Products	Commitment to source products that meet the transparency and sustainability requirements	The project will incorporate products that meet the transparency and sustainability requirements where deemed appropriate. This includes the following: reused products, recycled content products, environmental product declarations, third party certified and stewardship programs.

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>There is no existing building on the proposed site.</p>
Construction and Demolition Waste	<p>To reduce construction waste going to landfill</p> <p>The project will aim divert at least 80% of the waste generated during construction and demolition from landfill.</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 intended to be provided to the outdoor communal areas.</p>
Convenience of Recycling	<p>To ensure waste avoidance, reuse, and recycling during the operational life of the building.</p>  <p>Separate general, and recycling waste storage will be provided at basement. Glass waste storage will be provided at ground level in a communal area.</p> <p>Kitchen joinery for the independent living units are to provide appropriate spatial allowance for food and organics, general and recycling waste collection.</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

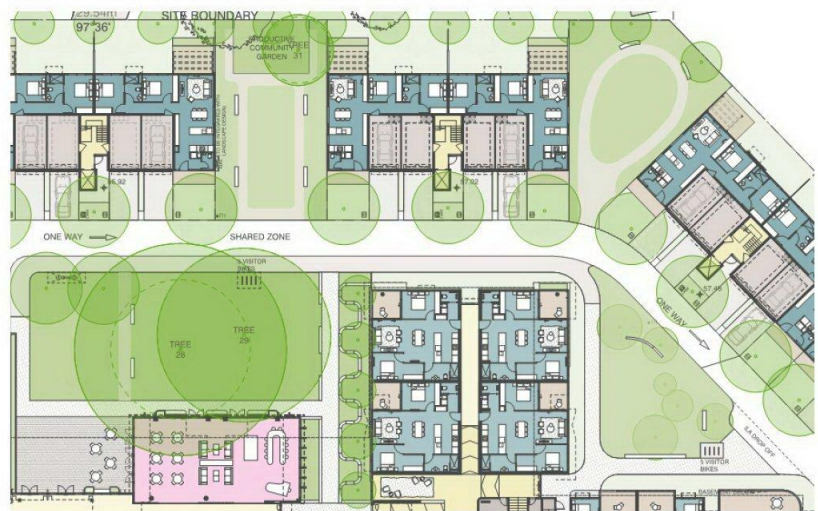
Criteria

Development Provision

A minimum of 212m² of communal space will be provided throughout the site. Communal space can include the following amenities: food and beverage area, theatre, wellness centre including gym and flex studio, dining areas, lounges, library, gardens, sitting areas, productive gardens, and walkways.

Communal Space

To encourage and recognise initiatives that facilitate interaction between building occupants.



Communal space will be located throughout the site.

Council Best Practice Standard

Criteria		Development Provision
Vegetation	To encourage and recognise the use of vegetation and landscaping within and around developments.	<p>Landscaped areas are to be located in villa POS, central gardens, and adjacent to main walkways.</p> <p>The total area of vegetation is to be approximately 30% of the site area.</p>
Green Walls / Roof	To encourage the appropriate use of green roofs, walls, and facades to mitigate the impact of the urban heat island effect.	NIL
Private Open Space - Balcony / Courtyard Ecology	To encourage plants in a healthy ecological context to be grown on balconies and in courtyards.	It is intended that all villa ground floor POS will be provided with a tap and waste allowing residents to cultivate their own gardens.
Food Production - Residential	To encourage the production of fresh food on-site.	The development will seek to provide a minimum of 111m ² of communal food production area will be provided within the appropriate outdoor areas.
Heat Island Effect	To reduce the contribution of the project site to the 'heat island effect	<p>Roofs are to have a three-year SRI of minimum 60.</p> <p>Unshaded hard-scaping elements are to have a three-year SRI of minimum 34 or an initial SRI of minimum 39.</p>

Innovation

Council ESD objectives:

- To encourage innovative technology, design, and processes in all development, which positively influence the sustainability of buildings.

Council Best Practice Standard

Criteria		Development Provision
ESD Checkpoint during Construction Phase	To ensure that all ESD items are suitably installed and incorporated during construction.	<p>An ESD professional will be engaged throughout the design and construction process. The ESD professional will perform a minimum of 2 site inspections during the construction phase to ensure suitable implementation of the ESD initiatives. Any deficiencies compared to the endorsed SMP will be escalated to the project manager and resolved.</p> <p>The checkpoint assessments will be undertaken at two stages as follows:</p> <ul style="list-style-type: none"> • Site Inspection 1: Prior to installation of internal linings. • Site inspection 2: At the time of project completion.

Appendices

Appendix A: WSUD Response

A compliant MUSIC model was provided by Colliers. Refer Stormwater Management Plan by Colliers Revision B dated December 2022.

WSUD Strategy

The intended aged care village will include the provision of 2off. 20,000-litre rainwater tanks and associated pump in the basement garage. The first rainwater tank is to be connected to all WC's and landscape irrigation within the apartment building, while the second rainwater tank is to be connected to the laundries and landscape irrigation for the RAC / ALA building.

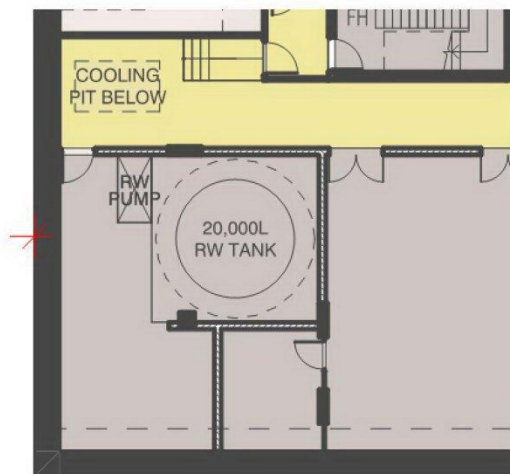


Figure 2 – Location Rainwater Tank 1

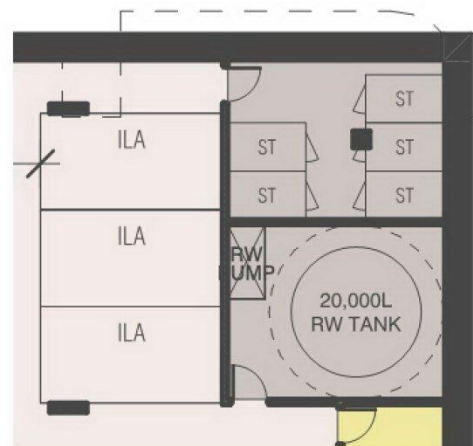


Figure 3 – Location Rainwater Tank 2

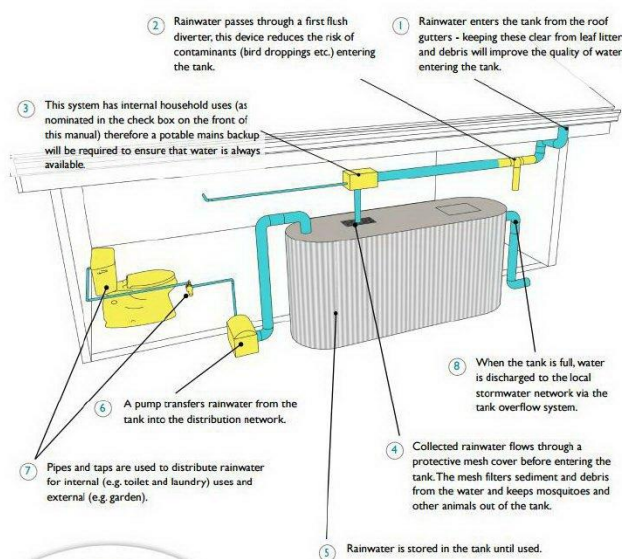


Figure 4 – Cross-section Tank (City of Port Phillip)

Rainwater Reuse

ALA / RAC Building Rainwater Tank

Inputs

Catchment Area	1481	sqm
Bin Washout	No	
Irrigation Area	731	sqm
Tank Capacity	20,000	Litre

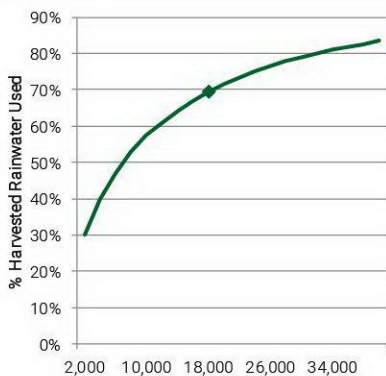
Outputs

% Served by Rainwater	50.7%
% Harvested Rainwater Used	70.3%
Total Potable Water Saved	279,348 Litre

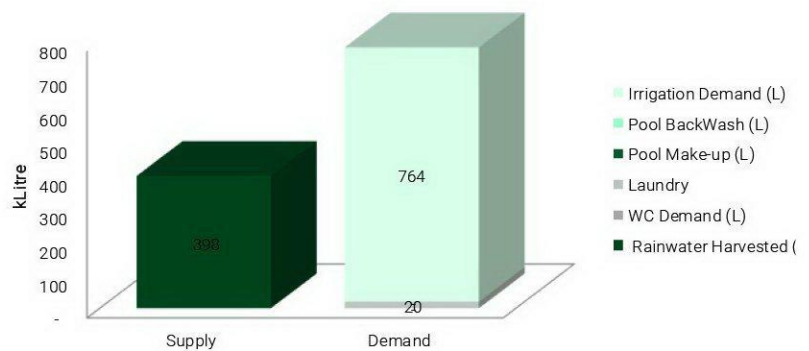
Rainwater Balance (Monthly Averages)

Month	Rainwater Harvested (L)	WC Demand (L)	Laundry (L)	Pool Make-up (L)	Pool Backwash (L)	Irrigation Demand (L)
Jan	31644	0	1800	0	0	113430
Feb	34490	0	1652	0	0	102436
Mar	28392	0	1800	0	0	52420
Apr	31858	0	1800	0	0	50295
May	32179	0	1800	0	0	52066
Jun	28349	0	1800	0	0	23516
Jul	22199	0	1800	0	0	24174
Aug	26443	0	1800	0	0	24174
Sep	37534	0	1800	0	0	68738
Oct	38868	0	1800	0	0	70661
Nov	47089	0	1800	0	0	68738
Dec	38538	0	0	0	0	113430
Total	397581	0	19652	0	0	764077
Equivalent STORM tool		0.00	2.69	0.00	0.00	

Tank Sizing



Supply-Demand



Apartment Building Rainwater Tank

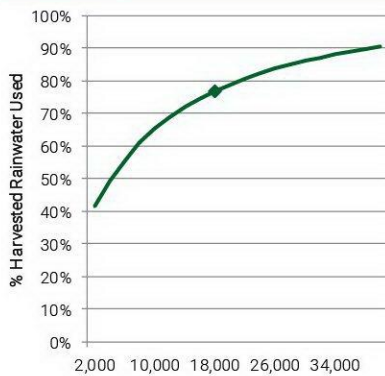
Inputs

Catchment Area	1653	sqm
Number of Bedrooms	87	
Bin Washout	No	
Irrigation Area	852	sqm
Tank Capacity	20,000	Litre
Outputs		
% Served by Rainwater	33.0%	
% Harvested Rainwater Used	79.5%	
Total Potable Water Saved	400,119	Litre

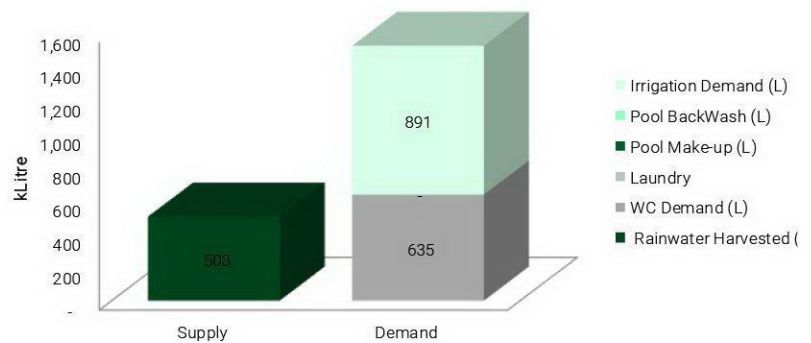
Rainwater Balance (Monthly Averages)

Month	Rainwater Harvested (L)	WC Demand (L)	Laundry (L)	Pool Make-up (L)	Pool Backwash (L)	Irrigation Demand (L)
Jan	36234	53940	0	0	0	132205
Feb	39344	48720	0	0	0	119392
Mar	34893	53940	0	0	0	61097
Apr	40789	52200	0	0	0	58620
May	39461	53940	0	0	0	60684
Jun	40359	52200	0	0	0	27408
Jul	33326	53940	0	0	0	28175
Aug	43792	53940	0	0	0	28175
Sep	45295	52200	0	0	0	80116
Oct	45880	53940	0	0	0	82357
Nov	59551	52200	0	0	0	80116
Dec	44090	53940	0	0	0	132205
Total	503012	635100	0	0	0	890552
Equivalent STORM tool		87.00	0.00	0.00	0.00	

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

Appendix B: Preliminary FirstRate Certificates

Nationwide House Energy Rating Scheme

NatHERS Certificate

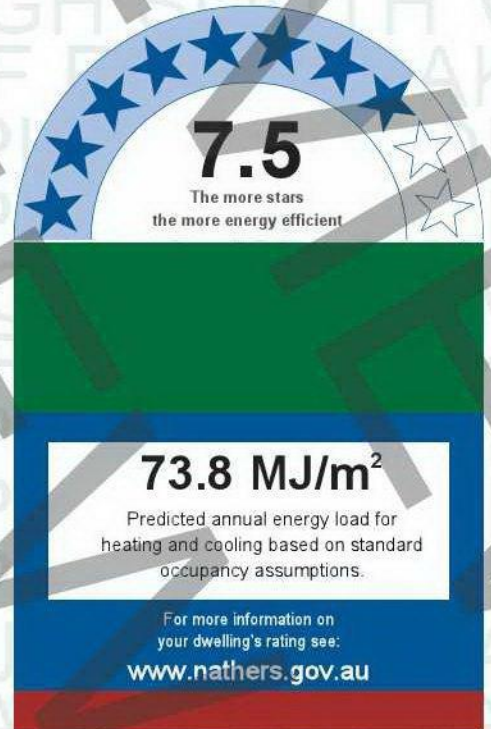
Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 1, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	69.6	suburban
Unconditioned*	2.2	NatHERS climate zone
Total	71.8	62 Moorabbin Airport
Garage	-	

Thermal performance

Heating	Cooling
70.5	3.3
MJ/m²	MJ/m²

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

Name	Gary Wertheimer
Business name	GIW Environmental Solutions
Email	gary@giw.com.au
Phone	0390445111
Accreditation No.	DMN/10/2024
Assessor Accrediting Organisation	Design Matters National
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.

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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Kitchen/Living	CAP-057-13 A	Opening 5	2700	2644	sliding	45.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 6	2700	1300	fixed	0.0	S	No

* Refer to glossary.

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Bedroom 1	CAP-041-52 A	Opening 1	1900	1000	fixed	0.0	S	No
Bedroom 1	CAP-051-06 A	Opening 2	1900	560	awning	60.0	S	No
Bedroom 2	CAP-051-06 A	Opening 4	1500	1000	awning	90.0	S	No
Bedroom 2	CAP-041-52 A	Opening 7	1500	1000	fixed	0.0	S	No

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 ²)	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 ²)	Orient-ation	Outdoor shade	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	52Golf - Retaining	0.5	Medium		No
2	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No
3	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)	No

External wall schedule

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Shared Basement	1	2800	21840	E	0	No
Shared Basement	1	2800	43920	N	0	No
Shared Basement	1	2800	21880	W	0	No
Shared Basement	1	2800	43920	S	0	No
Kitchen/Living	2	2800	5973	N	0	No
Kitchen/Living	3	2800	4062	S	2222	Yes
Kitchen/Living	2	2800	7490	E	0	No
Bedroom 1	2	2800	5677	W	0	No
Bedroom 1	3	2800	1710	S	2074	Yes
Bedroom 2	3	2800	1865	W	1742	Yes
Bedroom 2	3	2800	3096	S	0	Yes
Bedroom 2	3	2800	2012	E	4054	Yes
Bathroom	2	2800	2946	N	0	No
Bathroom	2	2800	1748	W	0	No

Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	48.9	

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Shared Basement	FR5 - CSOG: Slab on Ground	960.1	Enclosed	R0.0	none
Kitchen/Living	FR5 - 200mm concrete slab	37.7	Enclosed	R2.3	Timber
Bedroom 1	FR5 - 200mm concrete slab	17	Enclosed	R2.3	Carpet
Powder	FR5 - 200mm concrete slab	2.2	Enclosed	R2.3	Tiles
Bedroom 2	FR5 - 200mm concrete slab	9.8	Enclosed	R2.3	Carpet
Bathroom	FR5 - 200mm concrete slab	5.2	Enclosed	R2.3	Tiles

Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Shared Basement	FR5 - 200mm concrete slab	R2.3	No
Shared Basement	Plasterboard	R0.0	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living	15	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed
Bedroom 1	6	Downlights	80	Sealed
Powder	1	Downlights	80	Sealed

* Refer to glossary.

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Powder	1	Exhaust Fans	200	Sealed
Bedroom 2	3	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	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.

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Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
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Ceiling penetrations	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.
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Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
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Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
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Horizontal shading feature	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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Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21) for Sample 1, 52 Golf Road, Oakleigh

Page 6 of 7

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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.

National Construction Code (NCC) Class	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 www.abcb.gov.au .
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	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 www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	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.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	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

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 2, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



75.9 MJ/m²

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

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	102.3	suburban
Unconditioned*	3.2	NatHERS climate zone
Total	105.5	62 Moorabbin Airport
Garage	-	

Thermal performance

Heating	Cooling
55.1	20.8
MJ/m ²	MJ/m ²

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.



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	Design Matters National
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.

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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 1	CAP-041-52 A	Opening 8	1800	1000	fixed	0.0	N	No
Bedroom 1	CAP-051-06 A	Opening 9	2700	1000	awning	90.0	N	No

* Refer to glossary.

NatHERS Certificate

7.4 Star Rating as of 12 Dec 2022

Bedroom 2	CAP-041-52 A	Opening 24	1400	750	fixed	0.0	W	No
Bedroom 2	CAP-041-52 A	Opening 25	1400	750	fixed	0.0	W	No
Bedroom 2	CAP-051-06 A	Opening 26	1400	750	awning	90.0	W	No
Bedroom 2	CAP-041-52 A	Opening 27	1400	750	fixed	0.0	W	No
Master Bedroom	CAP-041-52 A	Opening 20	1800	550	fixed	0.0	W	No
Master Bedroom	CAP-051-06 A	Opening 21	1800	955	awning	90.0	W	No
Study	CAP-051-06 A	Opening 13	1700	1000	awning	60.0	N	No
Kitchen/Living	CAP-057-13 A	Opening 15	2700	3610	sliding	45.0	N	No
Kitchen/Living	CAP-041-52 A	Opening 29	1900	900	fixed	0.0	W	No
Kitchen/Living	CAP-051-06 A	Opening 30	1900	900	awning	60.0	W	No
Kitchen/Living	CAP-041-52 A	Opening 23	1900	900	fixed	0.0	W	No
Kitchen/Living	CAP-051-06 A	Opening 22	1900	900	awning	60.0	W	No
Kitchen/Living	CAP-041-52 A	Opening 31	1900	900	fixed	0.0	W	No

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 ²)	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 ²)	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	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No
2	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.5)	No
3	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	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	3200	1491	E	0	No
Bedroom 1	2	3200	1334	E	0	Yes
Bedroom 1	3	3200	3900	N	195	No
Bedroom 2	3	3200	484	W	0	Yes
Bedroom 2	3	3200	894	W	0	Yes
Bedroom 2	3	3200	661	W	0	Yes
Bedroom 2	3	3200	783	W	0	Yes
Bedroom 2	3	3200	752	W	0	Yes
Bedroom 2	3	3200	2043	S	1565	Yes
Master Bedroom	3	3200	1584	W	2153	Yes
Master Bedroom	1	3200	5483	S	0	No
Ensuite	1	3200	1963	S	0	No
Ensuite	1	3200	3443	E	0	No
Bathroom	1	3200	1788	E	0	No
Study	3	3200	1849	N	172	No
Study	3	3200	2912	W	3746	Yes
Kitchen/Living	3	3200	3667	N	3227	Yes
Kitchen/Living	3	3200	791	W	0	Yes
Kitchen/Living	3	3200	901	W	0	Yes
Kitchen/Living	3	3200	928	W	0	Yes
Kitchen/Living	3	3200	923	W	0	Yes
Kitchen/Living	3	3200	1030	W	0	Yes
Kitchen/Living	1	3200	4601	E	0	No

Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	108.9	

Floor type

NatHERS Certificate

7.4 Star Rating as of 12 Dec 2022

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - 200mm concrete slab	11	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 200mm concrete slab	11.3	Enclosed	R0.0	Carpet
Master Bedroom	FR5 - 200mm concrete slab	16.7	Enclosed	R0.0	Carpet
Ensuite	FR5 - 200mm concrete slab	6.8	Enclosed	R0.0	Tiles
Bathroom	FR5 - 200mm concrete slab	5.9	Enclosed	R0.0	Tiles
Laundry	FR5 - 200mm concrete slab	3.2	Enclosed	R0.0	Timber
Study	FR5 - 200mm concrete slab	5.4	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - 200mm concrete slab	45.2	Enclosed	R0.0	Timber

Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 1	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Master Bedroom	Plasterboard	R6.3	No
Ensuite	Plasterboard	R6.3	No
Bathroom	Plasterboard	R6.3	No
Laundry	Plasterboard	R6.3	No
Study	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 1	4	Downlights	80	Sealed
Bedroom 2	4	Downlights	80	Sealed
Master Bedroom	7	Downlights	80	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Laundry	1	Downlights	80	Sealed
Study	2	Downlights	80	Sealed
Kitchen/Living	16	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

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

* Refer to glossary.

Framed:Flat - Flat Framed (Metal Deck)

0.0

0.2

Light

Explanatory Notes

About this report

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Nationwide House Energy Rating Scheme

NatHERS Certificate

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 3, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



100.7 MJ/m²

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

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	68.7	suburban
Unconditioned*	52.8	NatHERS climate zone
Total	121.5	62 Moorabbin Airport
Garage	48	

Thermal performance

Heating	Cooling
93.4	7.3
MJ/m²	MJ/m²

About the rating

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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

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

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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	
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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*
Bedroom 1	CAP-041-52 A	Opening 9	1900	1940	fixed	0.0	N	No
Bedroom 1	CAP-051-06 A	Opening 10	1900	970	awning	60.0	N	No

* Refer to glossary.

NatHERS Certificate

6.7 Star Rating as of 12 Dec 2022

Bedroom 2	CAP-051-06 A	Opening 13	1900	970	awning	60.0	S	No
Bedroom 2	CAP-041-52 A	Opening 14	1900	1940	fixed	0.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 12	1600	2500	fixed	0.0	S	No
Kitchen/Living	CAP-057-13 A	Opening 11	2400	3450	sliding	45.0	N	No

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 ²)	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 ²)	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
Garage 1	2400	2900	100.0	N
Garage 2	2400	2900	100.0	S
Kitchen/Living	2700	1005	100.0	S

External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	No
2	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No

External wall schedule

* Refer to glossary.

NatHERS Certificate

6.7 Star Rating as of 12 Dec 2022

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Garage 1	1	2800	3784	W	0	Yes
Garage 1	2	2800	3248	W	0	No
Garage 1	1	2800	2493	E	3721	Yes
Garage 1	1	2800	3454	N	0	Yes
Garage 2	2	2800	4752	W	0	No
Garage 2	1	2800	2240	W	0	Yes
Garage 2	1	2800	3432	S	0	No
Garage 2	1	2800	1948	E	3691	Yes
Bedroom 1	1	2800	1946	W	3728	Yes
Bedroom 1	1	2800	3803	E	0	Yes
Bedroom 1	1	2800	2919	N	0	Yes
Bedroom 2	1	2800	2887	S	0	Yes
Bedroom 2	1	2800	3742	E	0	Yes
Bedroom 2	1	2800	1531	W	3709	Yes
Bathroom 1	1	2800	3151	E	0	Yes
Bathroom 2	1	2800	2077	E	0	Yes
Kitchen/Living	1	2800	3685	S	1568	Yes
Kitchen/Living	1	2800	3722	N	2084	Yes

Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	57.3	
2	52Golf - Ext	26.6	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Garage 1	FR5 - 200mm concrete slab	16.9	Enclosed	R1.4	none
Garage 1	FR5 - 200mm concrete slab	7.3	Enclosed	R1.4	none
Garage 2	FR5 - 200mm concrete slab	5.8	Enclosed	R1.4	none
Garage 2	FR5 - 200mm concrete slab	18.1	Enclosed	R1.4	none
Bedroom 1	FR5 - 200mm concrete slab	11.1	Enclosed	R1.4	Carpet
Bedroom 2	FR5 - 200mm concrete slab	10.5	Enclosed	R1.4	Carpet
Bathroom 1	FR5 - 200mm concrete slab	5.6	Enclosed	R1.4	Tiles
Bathroom 2	FR5 - 200mm concrete slab	4.8	Enclosed	R1.4	Tiles
Kitchen/Living	FR5 - 200mm concrete slab	32.5	Enclosed	R1.4	Timber
Kitchen/Living	FR5 - 200mm concrete slab	8.9	Enclosed	R1.4	Timber

Ceiling type

* Refer to glossary.

NathERS Certificate

6.7 Star Rating as of 12 Dec 2022

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Garage 1	Plasterboard	R0.0	No
Garage 2	Plasterboard	R0.0	No
Bedroom 1	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Bathroom 1	Plasterboard	R6.3	No
Bathroom 2	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Garage 1	8	Downlights	80	Sealed
Garage 2	10	Downlights	80	Sealed
Bedroom 1	4	Downlights	80	Sealed
Bedroom 2	4	Downlights	80	Sealed
Bathroom 1	2	Downlights	80	Sealed
Bathroom 1	1	Exhaust Fans	200	Sealed
Bathroom 2	2	Downlights	80	Sealed
Bathroom 2	1	Exhaust Fans	200	Sealed
Kitchen/Living	15	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Ceil: Ceiling	0.0	0.5	Medium
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.5	Medium
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.4	Medium

Explanatory Notes

About this report

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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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Conditioned	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.
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Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	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).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category - protected	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
Horizontal shading feature	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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Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21) for Sample 3, 52 Golf Road, Oakleigh

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National Construction Code (NCC) Class	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 www.abcb.gov.au .
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	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 www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	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.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	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

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 4, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	94	suburban
Unconditioned*	4.8	NatHERS climate zone
Total	98.8	62 Moorabbin Airport
Garage	-	



Accredited assessor

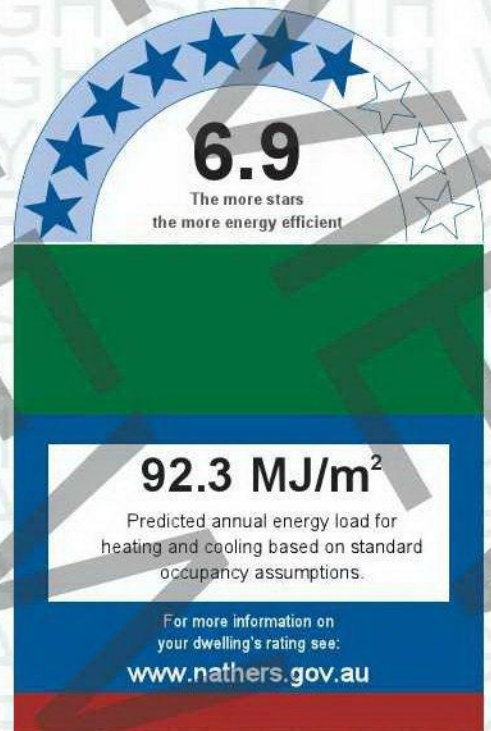
Name	Gary Wertheimer
Business name	GIW Environmental Solutions
Email	gary@giw.com.au
Phone	0390445111
Accreditation No.	DMN/10/2024
Assessor Accrediting Organisation	Design Matters National
Declaration of interest	Declaration completed: no conflicts

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.

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



Thermal performance

Heating	Cooling
79.8	12.5
MJ/m²	MJ/m²

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.

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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 1	CAP-051-06 A	Opening 1	1550	750	awning	90.0	N	No
Bedroom 1	CAP-041-52 A	Opening 17	1550	1500	fixed	0.0	N	No

* Refer to glossary.

NatHERS Certificate

6.9 Star Rating as of 12 Dec 2022

Bedroom 2	CAP-041-52 A	Opening 10	2700	760	fixed	0.0	E	No
Bedroom 2	CAP-051-06 A	Opening 18	1550	750	awning	90.0	N	No
Bedroom 3	CAP-041-52 A	Opening 6	1400	1304	fixed	0.0	S	No
Bedroom 3	CAP-051-06 A	Opening 7	1400	1304	awning	60.0	S	No
Kitchen/Living	CAP-057-13 A	Opening 5	2700	3885	sliding	45.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 4	1400	1115	fixed	0.0	E	No
Kitchen/Living	CAP-051-06 A	Opening 3	1400	1100	awning	60.0	E	No
Hall	CAP-041-52 A	Opening 8	2700	1088	fixed	0.0	S	No
Hall	CAP-051-06 A	Opening 9	2700	997	awning	60.0	S	No

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 ²)	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 ²)	Orient-ation	Outdoor shade	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	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No

2 52Golf - Ext

0.5 Medium

Glass fibre batt (k = 0.044
density = 12 kg/m³) (R2.7)

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	2800	1585	S	0	No
Bedroom 1	2	2800	3955	N	0	Yes
Bedroom 1	1	2800	3152	W	0	No
Bedroom 2	2	2800	1142	W	0	Yes
Bedroom 2	2	2800	1027	E	0	Yes
Bedroom 2	2	2800	3324	N	0	No
Bedroom 3	2	2800	1451	W	2214	Yes
Bedroom 3	2	2800	3583	S	93	No
Bedroom 3	2	2800	2572	E	4659	Yes
Kitchen/Living	2	2800	3930	S	2665	Yes
Kitchen/Living	2	2800	5964	E	591	Yes
Kitchen/Living	2	2800	2439	E	0	No
Kitchen/Living	2	2800	4003	N	0	Yes
Hall	1	2800	6147	W	0	No
Hall	2	2800	2198	S	1544	Yes

Internal wall *type*

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	92	

Floor *type*

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - 200mm concrete slab	11.5	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 200mm concrete slab	1.5	Elevated	R2.3	Carpet
Bedroom 2	FR5 - 200mm concrete slab	15.1	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 200mm concrete slab	10.4	Elevated	R2.3	Carpet
Bathroom 1	FR5 - 200mm concrete slab	4.8	Elevated	R2.3	Tiles
Ensuite	FR5 - 200mm concrete slab	5.6	Elevated	R2.3	Tiles
Kitchen/Living	FR5 - 200mm concrete slab	4.4	Elevated	R2.3	Timber
Kitchen/Living	FR5 - 200mm concrete slab	28.9	Enclosed	R0.0	Timber
Hall	FR5 - 200mm concrete slab	16.4	Elevated	R2.3	Timber

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 1	Plasterboard	R6.3	No

NatHERS Certificate

6.9 Star Rating as of 12 Dec 2022

Bedroom 2	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Bedroom 3	Plasterboard	R6.3	No
Bathroom 1	Plasterboard	R6.3	No
Ensuite	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No
Hall	Plasterboard	R6.3	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 1	5	Downlights	80	Sealed
Bedroom 2	6	Downlights	80	Sealed
Bedroom 3	4	Downlights	80	Sealed
Bathroom 1	2	Downlights	80	Sealed
Bathroom 1	1	Exhaust Fans	200	Sealed
Ensuite	2	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	200	Sealed
Kitchen/Living	13	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed
Hall	7	Downlights	80	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.4	Medium

Explanatory Notes

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Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	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

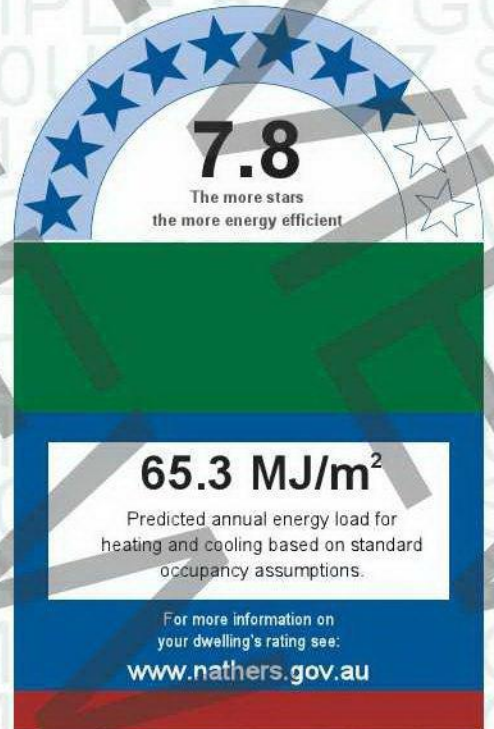
Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 5, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	74.8	suburban
Unconditioned*	46.8	NatHERS climate zone
Total	121.6	62 Moorabbin Airport
Garage	41.5	

Thermal performance

Heating	Cooling
46.9	18.4
MJ/m²	MJ/m²

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

Name	Gary Wertheimer
Business name	GIW Environmental Solutions
Email	gary@giw.com.au
Phone	0390445111
Accreditation No.	DMN/10/2024
Assessor Accrediting Organisation	Design Matters National
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.

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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5
CAP-048-06 A	200 Hinged Door into 400 Narrowline DG 6EA-12Ar-6	3.6	0.44	0.42	0.46
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*
Kitchen/Living	CAP-041-52 A	Opening 27	1600	1430	fixed	0.0	S	No

* Refer to glossary.

NatHERS Certificate

7.8 Star Rating as of 12 Dec 2022

Kitchen/Living	CAP-041-52 A	Opening 28	2400	550	fixed	0.0	S	No
Kitchen/Living	CAP-057-13 A	Opening 22	2400	3800	sliding	66.0	N	No
Kitchen/Living	CAP-041-52 A	Opening 20	1400	1200	fixed	0.0	W	No
Kitchen/Living	CAP-041-52 A	Opening 21	1400	2000	fixed	0.0	W	No
Bedroom 1	CAP-048-06 A	Opening 23	2400	1150	casement	90.0	N	No
Bedroom 1	CAP-041-52 A	Opening 24	850	1700	fixed	0.0	N	No
Bedroom 2	CAP-051-06 A	Opening 25	2400	1000	awning	60.0	N	No
Bedroom 2	CAP-041-52 A	Opening 26	2400	1000	fixed	0.0	N	No

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 ²)	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 ²)	Orientation	Outdoor shade	Skylight shaft reflectance
No Data Available							

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living	2400	1024	100.0	S
Garage	2400	3297	100.0	S
Garage	2400	3162	100.0	S

External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
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* Refer to glossary.

NatHERS Certificate

7.8 Star Rating as of 12 Dec 2022

1	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	No
2	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		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	2800	4258	S	1648	Yes
Kitchen/Living	1	2800	3732	N	0	Yes
Kitchen/Living	1	2800	10472	W	0	Yes
Bedroom 1	1	2800	3941	N	0	Yes
Bathroom	1	2800	1756	N	0	Yes
Bedroom 2	2	2800	1620	S	0	No
Bedroom 2	2	2800	4304	E	0	No
Bedroom 2	1	2800	3251	N	0	Yes
Garage	1	2800	3483	S	554	Yes
Garage	1	2800	3410	S	554	Yes
Garage	2	2800	5996	E	0	No

Internal wall *type*

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	61.4	
2	FR5 - Internal Plasterboard Stud Wall	35.7	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)

Floor *type*

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living	FR5 - 200mm concrete slab	19.1	Enclosed	R1.4	Timber
Kitchen/Living	FR5 - 200mm concrete slab	29.8	Enclosed	R1.4	Timber
Bedroom 1	FR5 - 200mm concrete slab	9.9	Enclosed	R1.4	Carpet
Bedroom 1	FR5 - 200mm concrete slab	2	Enclosed	R1.4	Carpet
Bathroom	FR5 - 200mm concrete slab	5.3	Enclosed	R1.4	Tiles
Bedroom 2	FR5 - 200mm concrete slab	10.3	Enclosed	R1.4	Carpet
Bedroom 2	FR5 - 200mm concrete slab	3.6	Enclosed	R1.4	Carpet
Garage	FR5 - 200mm concrete slab	4.9	Enclosed	R0.0	none
Garage	FR5 - 200mm concrete slab	16	Enclosed	R0.0	none
Garage	FR5 - 200mm concrete slab	1	Enclosed	R0.0	none
Garage	FR5 - 200mm concrete slab	19.5	Enclosed	R0.0	none

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Kitchen/Living	Plasterboard	R6.3	No

* Refer to glossary.

NatHERS Certificate

7.8 Star Rating as of 12 Dec 2022

Bedroom 1	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Garage	Plasterboard	R0.0	No
Garage	Plasterboard	R0.0	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living	20	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed
Bedroom 1	4	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bedroom 2	6	Downlights	80	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Ceil: Ceiling	0.0	0.5	Medium
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.4	Medium
Framed:Flat - Flat Framed (Metal Deck)	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

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	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.
Ceiling penetrations	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.
Conditioned	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.
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
Entrance door	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.
Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	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).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category - protected	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
Horizontal shading feature	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

* Refer to glossary.

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21) for Sample 5, 52 Golf Road, Oakleigh

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.

National Construction Code (NCC) Class	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 www.abcb.gov.au .
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	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 www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	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.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	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

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 6, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



73.9 MJ/m²

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

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	81.1	suburban
Unconditioned*	47.3	NatHERS climate zone
Total	128.4	62 Moorabbin Airport
Garage	45.5	

Thermal performance

Heating	Cooling
57.9	16
MJ/m²	MJ/m²

About the rating

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Verification

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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 Design Matters National
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.

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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.

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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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 1	CAP-041-52 A	Opening 21	2400	1900	fixed	0.0	S	No
Bedroom 1	CAP-051-06 A	Opening 22	2400	950	awning	60.0	S	No

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Bedroom 2	CAP-041-52 A	Opening 23	2400	1800	fixed	0.0	S	No
Bedroom 2	CAP-051-06 A	Opening 24	2400	900	awning	60.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 20	1600	1900	fixed	0.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 25	2400	1900	fixed	0.0	E	No
Kitchen/Living	CAP-041-52 A	Opening 26	2400	1000	fixed	0.0	E	No
Kitchen/Living	CAP-057-13 A	Opening 27	2400	3639	sliding	45.0	N	No

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 ²)	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 ²)	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living	2100	903	100.0	S
Garage	2400	3128	100.0	N
Garage	2400	3265	100.0	N

External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No
2	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	No

* Refer to glossary.

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	2800	2690	W	0	No
Bedroom 1	2	2800	1598	W	2502	Yes
Bedroom 1	2	2800	2969	S	0	Yes
Bedroom 2	2	2800	4248	S	0	Yes
Bedroom 2	2	2800	2562	E	3141	Yes
Bathroom	1	2800	2067	W	0	No
Kitchen/Living	2	2800	2962	S	2482	Yes
Kitchen/Living	2	2800	3973	E	0	Yes
Kitchen/Living	2	2800	803	S	0	Yes
Kitchen/Living	2	2800	6778	E	0	Yes
Kitchen/Living	2	2800	3796	N	0	Yes
Kitchen/Living	2	2800	128	W	0	Yes
Garage	2	2800	3254	W	0	Yes
Garage	1	2800	3109	W	0	No
Garage	2	2800	3524	N	0	Yes
Garage	2	2800	3593	N	0	Yes

Internal wall *type*

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	68.9	
2	FR5 - Internal Plasterboard Stud Wall	36.9	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)

Floor *type*

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - 200mm concrete slab	12.8	Enclosed	R1.4	Carpet
Bedroom 2	FR5 - 200mm concrete slab	1.5	Enclosed	R1.4	Carpet
Bedroom 2	FR5 - 200mm concrete slab	10.7	Enclosed	R1.4	Carpet
Bathroom	FR5 - 200mm concrete slab	6.2	Enclosed	R1.4	Tiles
WC	FR5 - 200mm concrete slab	0.8	Enclosed	R1.4	Tiles
WC	FR5 - 200mm concrete slab	0.9	Enclosed	R1.4	Tiles
Kitchen/Living	FR5 - 200mm concrete slab	38.5	Enclosed	R1.4	Timber
Kitchen/Living	FR5 - 200mm concrete slab	11.4	Enclosed	R1.4	Timber
Garage	FR5 - 200mm concrete slab	22.5	Enclosed	R0.0	none
Garage	FR5 - 200mm concrete slab	3.1	Enclosed	R0.0	none
Garage	FR5 - 200mm concrete slab	19.9	Enclosed	R0.0	none

Ceiling *type*

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 2	Plasterboard	R6.3	No
WC	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No
Garage	Plasterboard	R6.3	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 1	5	Downlights	80	Sealed
Bedroom 2	5	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
WC	1	Downlights	80	Sealed
WC	1	Exhaust Fans	200	Sealed
Kitchen/Living	18	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Ceil: Ceiling	0.0	0.5	Medium
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.4	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

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	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.
Ceiling penetrations	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.
Conditioned	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.
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
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Exposure category - open	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).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
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Horizontal shading feature	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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Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21) for Sample 6, 52 Golf Road, Oakleigh

Page 6 of 7

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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.

National Construction Code (NCC) Class	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 www.abcb.gov.au .
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	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 www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	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.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	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

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 7, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



73.4 MJ/m²

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

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	99.2	suburban
Unconditioned*	44.9	NatHERS climate zone
Total	144.1	62 Moorabbin Airport
Garage	40.2	

Thermal performance

Heating	Cooling
60.3	13.1
MJ/m²	MJ/m²

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.



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 Design Matters National
Declaration of interest Declaration completed: no conflicts

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).

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.

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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 3	CAP-051-06 A	Opening 24	2400	1000	awning	60.0	N	No
Bedroom 3	CAP-041-52 A	Opening 25	2400	1000	fixed	0.0	N	No

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Bedroom 2	CAP-051-06 A	Opening 22	2400	1000	awning	60.0	N	No
Bedroom 2	CAP-041-52 A	Opening 23	2400	1000	fixed	0.0	N	No
Bedroom 1	CAP-041-52 A	Opening 26	1800	1300	fixed	0.0	W	No
Bedroom 1	CAP-051-06 A	Opening 27	1800	700	awning	60.0	W	No
Kitchen/Living	CAP-041-52 A	Opening 20	1600	2423	fixed	0.0	N	No
Kitchen/Living	CAP-057-13 A	Opening 21	2400	3019	sliding	45.0	W	No
Kitchen/Living	CAP-041-52 A	Opening 28	1600	900	fixed	0.0	W	No

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 ²)	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 ²)	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door schedule

Location	Height (mm)	Width (mm)	Opening %	Orientation
Kitchen/Living	2400	905	100.0	N
Garage	2400	3095	100.0	E
Garage	2400	3027	100.0	N

External wall type

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	No

* Refer to glossary.

2	FR5 - Internal Plasterboard Stud Wall	0.5	Medium	No
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External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bathroom	1	2800	163	S	0	Yes
Bedroom 3	1	2800	1978	E	0	Yes
Bedroom 3	1	2800	2891	N	0	Yes
Bedroom 2	1	2800	2872	N	765	Yes
Bedroom 1	1	2800	458	W	0	Yes
Bedroom 1	1	2800	1950	W	500	Yes
Bedroom 1	1	2800	524	W	0	Yes
Bedroom 1	2	2800	4108	S	0	No
Bedroom 1	2	2800	1583	E	0	No
Ensuite	1	2800	1857	W	0	Yes
Kitchen/Living	1	2800	5244	N	744	Yes
Kitchen/Living	1	2800	5465	W	591	Yes
Kitchen/Living	1	2800	1059	S	0	Yes
Kitchen/Living	1	2800	2624	W	0	Yes
Garage	2	2800	4549	S	0	No
Garage	1	2800	1403	S	0	Yes
Garage	1	2800	3475	E	322	Yes
Garage	1	2800	3389	S	0	Yes
Garage	1	2800	5819	E	0	Yes
Garage	1	2800	3368	N	0	Yes

Internal wall *type*

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	130.6	

Floor *type*

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Study	FR5 - 200mm concrete slab	7	Enclosed	R1.4	Timber
Bathroom	FR5 - 200mm concrete slab	4.7	Enclosed	R1.4	Tiles
Bedroom 3	FR5 - 200mm concrete slab	10.4	Enclosed	R1.4	Carpet
Bedroom 2	FR5 - 200mm concrete slab	5.5	Enclosed	R1.4	Carpet
Bedroom 2	FR5 - 200mm concrete slab	4.9	Enclosed	R1.4	Carpet
Bedroom 1	FR5 - 200mm concrete slab	11.5	Enclosed	R1.4	Carpet
Bedroom 1	FR5 - 200mm concrete slab	1.6	Enclosed	R1.4	Carpet
Ensuite	FR5 - 200mm concrete slab	5.4	Enclosed	R1.4	Tiles
Kitchen/Living	FR5 - 200mm concrete slab	16.5	Enclosed	R1.4	Timber

NatHERS Certificate

7.5 Star Rating as of 12 Dec 2022

Kitchen/Living	FR5 - 200mm concrete slab	36.4	Enclosed	R1.4	Timber
Garage	FR5 - 200mm concrete slab	20.6	Enclosed	R0.0	none
Garage	FR5 - 200mm concrete slab	19.6	Enclosed	R0.0	none

Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 2	Plasterboard	R5.0	No
Bedroom 1	Plasterboard	R5.0	No
Kitchen/Living	Plasterboard	R5.0	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Study	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Bedroom 3	4	Downlights	80	Sealed
Bedroom 2	4	Downlights	80	Sealed
Bedroom 1	5	Downlights	80	Sealed
Ensuite	2	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	200	Sealed
Kitchen/Living	20	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Ceil: Ceiling	0.0	0.5	Medium
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.5	Medium

Explanatory Notes

About this report

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Nationwide House Energy Rating Scheme

NatHERS Certificate

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 8, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	90.1	suburban
Unconditioned*	4.8	NatHERS climate zone
Total	94.9	62 Moorabbin Airport
Garage	-	

Thermal performance

Heating	Cooling
34.1	8
MJ/m²	MJ/m²

About the rating

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Verification

To verify this certificate, scan the QR code or visit www.FR5.com.au. When using either link, ensure you are visiting www.FR5.com.au.



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 Design Matters National
Declaration of interest Declaration completed: no conflicts

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Does the installed window meet the substitution tolerances (SHGC and U-value) and window type, of the window shown on this Certificate? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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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.

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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
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CAP-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 3	CAP-051-06 A	Opening 12	2400	990	awning	60.0	S	No
Bedroom 3	CAP-041-52 A	Opening 13	2400	990	fixed	0.0	S	No

* Refer to glossary.

NatHERS Certificate

8.5 Star Rating as of 12 Dec 2022

Room	Window ID	Opening	Area (m ²)	U-value	Glazing	SHGC	Orientation	SHGC
Bedroom 2	CAP-041-52 A	Opening 14	2400	990	fixed	0.0	S	No
Bedroom 1	CAP-057-13 A	Opening 11	2400	2828	sliding	40.0	E	No
Kitchen/Living	CAP-057-13 A	Opening 10	2400	5433	sliding	60.0	E	No

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 ²)	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 ²)	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	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No
2	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (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)
Bedroom 3	1	2800	1186	W	0	No

* Refer to glossary.

NatHERS Certificate

8.5 Star Rating as of 12 Dec 2022

Room	Count	Area (m ²)	Volume (m ³)	Orientation	U-value	Insulation
Bedroom 3	2	2800	1619	W	0	Yes
Bedroom 3	2	2800	4676	S	0	Yes
Bedroom 2	2	2800	3276	S	0	Yes
Bedroom 1	2	2800	3654	S	0	Yes
Bedroom 1	2	2800	3082	E	2761	Yes
Ensuite	1	2800	2739	N	0	No
Ensuite	1	2800	1662	W	0	No
Bathroom	1	2800	2978	W	0	No
Kitchen/Living	2	2800	6261	E	2793	Yes
Kitchen/Living	1	2800	9107	N	0	No
Kitchen/Living	1	2800	1424	W	0	No

Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	74.2	

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 3	FR5 - 200mm concrete slab	13.2	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 200mm concrete slab	10.6	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 200mm concrete slab	11.2	Enclosed	R0.0	Carpet
Ensuite	FR5 - 200mm concrete slab	4.8	Enclosed	R0.0	Tiles
Bathroom	FR5 - 200mm concrete slab	5.9	Enclosed	R0.0	Tiles
Kitchen/Living	FR5 - 200mm concrete slab	49.2	Enclosed	R0.0	Timber

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 3	5	Downlights	80	Sealed
Bedroom 2	4	Downlights	80	Sealed
Bedroom 1	4	Downlights	80	Sealed
Ensuite	2	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	200	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
Kitchen/Living	20	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	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

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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

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Ceiling penetrations	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.
Conditioned	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.
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Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
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Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21) for Sample 8, 52 Golf Road, Oakleigh

Page 6 of 7

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National Construction Code (NCC) Class	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 www.abcb.gov.au .
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	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 www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	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.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	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

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)



Property

Address Sample 9, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -



Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	76	suburban
Unconditioned*	2.5	NatHERS climate zone
Total	78.5	62 Moorabbin Airport
Garage	-	

Thermal performance

Heating	Cooling
64	20.7
MJ/m ²	MJ/m ²

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.



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 Design Matters National
Declaration of interest Declaration completed: no conflicts

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)

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.

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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 2	CAP-051-06 A	Opening 10	2400	900	awning	60.0	N	No
Bedroom 2	CAP-041-52 A	Opening 11	2400	900	fixed	0.0	N	No

* Refer to glossary.

NatHERS Certificate

7.2 Star Rating as of 12 Dec 2022

Bedroom 1	CAP-041-52 A	Opening 12	900	1100	fixed	0.0	N	No
Bedroom 1	CAP-051-06 A	Opening 13	2400	1000	awning	60.0	W	No
Kitchen/Living	CAP-041-52 A	Opening 18	1350	3050	fixed	0.0	S	No
Kitchen/Living	CAP-057-13 A	Opening 16	2400	3630	sliding	45.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 17	2400	1759	fixed	0.0	S	No
Kitchen/Living	CAP-041-52 A	Opening 14	2400	1000	fixed	0.0	E	No
Kitchen/Living	CAP-041-52 A	Opening 15	2400	1106	fixed	0.0	E	No
Kitchen/Living	CAP-041-52 A	Opening 19	1000	2000	fixed	0.0	N	No

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 ²)	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 ²)	Orientation	Outdoor shade	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	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No
2	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

* Refer to glossary.

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 2	1	2800	2949	W	0	No
Bedroom 2	1	2800	1580	S	0	No
Bedroom 2	1	2800	1083	W	0	No
Bedroom 2	2	2800	3581	N	200	Yes
Bedroom 1	2	2800	961	E	0	Yes
Bedroom 1	2	2800	3073	N	0	No
Bedroom 1	2	2800	1217	W	0	Yes
WC	1	2800	1911	W	0	No
Kitchen/Living	1	2800	1639	W	0	No
Kitchen/Living	2	2800	916	W	1397	Yes
Kitchen/Living	2	2800	3201	S	643	Yes
Kitchen/Living	2	2800	1043	E	0	Yes
Kitchen/Living	2	2800	5704	S	1686	Yes
Kitchen/Living	2	2800	7967	E	616	Yes
Kitchen/Living	2	2800	3556	N	0	Yes

Internal wall *type*

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	66.9	

Floor *type*

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 2	FR5 - 200mm concrete slab	2	Elevated	R2.3	Carpet
Bedroom 2	FR5 - 200mm concrete slab	9.9	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 200mm concrete slab	13	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	5.5	Elevated	R2.3	Tiles
Bathroom	FR5 - 200mm concrete slab	0.3	Enclosed	R0.0	Tiles
WC	FR5 - 200mm concrete slab	2.5	Elevated	R2.3	Tiles
Kitchen/Living	FR5 - 200mm concrete slab	20.7	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - 200mm concrete slab	24.5	Elevated	R2.3	Timber
Kitchen/Living	FR5 - 200mm concrete slab	0.2	Enclosed	R0.0	Timber

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 2	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Bedroom 1	Plasterboard	R6.3	No

NatHERS Certificate

7.2 Star Rating as of 12 Dec 2022

Bathroom	Plasterboard	R6.3	No
WC	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 2	5	Downlights	80	Sealed
Bedroom 1	5	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	200	Sealed
WC	1	Downlights	80	Sealed
WC	1	Exhaust Fans	200	Sealed
Kitchen/Living	18	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.4	Medium

* Refer to glossary.

Explanatory Notes

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Nationwide House Energy Rating Scheme

NatHERS Certificate

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21)

Property

Address Sample 10, 52 Golf Road, Oakleigh South, VIC, 3167
Lot/DP -
NCC Class* Class 2
Type New Home

Plans

Main plan -
Prepared by -

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	66.2	suburban
Unconditioned*	4.6	NatHERS climate zone
Total	70.8	62 Moorabbin Airport
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	Design Matters National
Declaration of interest	Declaration completed: no conflicts

National Construction Code (NCC) requirements

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Thermal performance

Heating	Cooling
97	19.5
MJ/m²	MJ/m²

About the rating

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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? Substituted values must be based on the Australian Fenestration Rating Council (AFRC) protocol.

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-041-52 A	Capral 425 Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61
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*
Bedroom 1	CAP-041-52 A	Opening 9	2600	1250	fixed	0.0	N	No
Bedroom 1	CAP-051-06 A	Opening 10	2600	1250	awning	60.0	N	No

* Refer to glossary.

NatHERS Certificate

6.3 Star Rating as of 12 Dec 2022

Bedroom 2	CAP-041-52 A	Opening 7	2600	1250	fixed	0.0	S	No
Bedroom 2	CAP-051-06 A	Opening 8	2600	1250	awning	60.0	S	No
Kitchen/Living	CAP-057-13 A	Opening 5	2600	3400	sliding	45.0	N	No
Kitchen/Living	CAP-057-13 A	Opening 6	2600	3400	sliding	45.0	S	No

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 ²)	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 ²)	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	52Golf - Ext	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	No
2	FR5 - Internal Plasterboard Stud Wall	0.5	Medium		No

External wall schedule

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
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* Refer to glossary.

NatHERS Certificate

6.3 Star Rating as of 12 Dec 2022

Bedroom 1	1	2800	3792	W	521	Yes
Bedroom 1	1	2800	1981	E	3548	Yes
Bedroom 1	1	2800	2907	N	0	Yes
Bathroom	1	2800	3243	W	413	Yes
WC and Laundry	1	2800	2159	W	418	Yes
Bedroom 2	1	2800	3535	W	410	Yes
Bedroom 2	1	2800	2934	S	0	Yes
Bedroom 2	1	2800	1490	E	3520	Yes
Kitchen/Living	2	2800	8381	E	0	No
Kitchen/Living	1	2800	1304	E	0	Yes
Kitchen/Living	1	2800	3471	N	2145	Yes
Kitchen/Living	1	2800	3495	S	1446	Yes

Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	47.4	

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - Timber	5.7	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - Timber	5.3	Elevated	R5.0	Carpet
Bathroom	FR5 - Timber	5.8	Enclosed	R0.0	Tiles
WC and Laundry	FR5 - Timber	4.6	Enclosed	R0.0	Tiles
Bedroom 2	FR5 - Timber	3.3	Elevated	R5.0	Carpet
Bedroom 2	FR5 - Timber	7	Enclosed	R0.0	Carpet
Kitchen/Living	FR5 - Timber	39.2	Enclosed	R0.0	Timber

Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 1	Plasterboard	R6.3	No
Bedroom 1	Plasterboard	R6.3	No
Bathroom	Plasterboard	R6.3	No
WC and Laundry	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Kitchen/Living	Plasterboard	R6.3	No

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 1	4	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed

* Refer to glossary.

NatHERS Certificate

6.3 Star Rating as of 12 Dec 2022

Bathroom	1	Exhaust Fans	200	Sealed
WC and Laundry	2	Downlights	80	Sealed
WC and Laundry	1	Exhaust Fans	200	Sealed
Bedroom 2	4	Downlights	80	Sealed
Kitchen/Living	16	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	200	Sealed

Ceiling fans

Location	Quantity	Diameter (mm)
No Data Available		

Roof type

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	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

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	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.
Ceiling penetrations	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.
Conditioned	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.
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
Entrance door	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.
Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	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).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category - protected	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
Horizontal shading feature	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

* Refer to glossary.

Generated on 12 Dec 2022 using FirstRate5: 5.3.2b (3.21) for Sample 10, 52 Golf Road, Oakleigh

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.

National Construction Code (NCC) Class	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 www.abcb.gov.au .
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	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 www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	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.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	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.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	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: Preliminary JV3 Energy Modelling

The proposed RAC/ALA building is located in Climate Zone 6 and is classified as a Class 9c Aged Care Building under the National Construction Code (NCC) 2019. In this preliminary assessment a typical level (level 1) has been assessed to determine the energy performance of the proposed village.

The NCC states that Alternative Solution: Verification Method JV3 may be applied as a viable Assessment Method to demonstrate achievement of the Performance Requirement JP1. The services documentation is to be certified by the projects RBP.

JV3 modelling simulates predicted annual GHG emissions for two building Models as follows:

- Model 1: Simulates the building with full DTS compliance and is known as the 'Reference Building';
- Model 2: Simulates the architecture as depicted in the contract documentation with services modelled as DTS compliant.

To determine a compliant result for the intended building, the predicted annual GHG emissions of Model 2 is to be less than that of Model 1.

JV3 Compliance Requirements

The building energy models demonstrate that the annual GHG emissions of the proposed building with reference services (Model 2) is less than that of the reference building (Model 1). This is deemed to be a compliant solution under NCC Section J – Verification Method JV3. Refer Section: 'Results' for modelling outputs.

The following thermal performance requirements form the basis of the JV3 Compliance Report. It is the responsibility of the applicant / permit holder to ensure the performance requirements are constructed to the satisfaction of the RBS.

Glazing	Thermal Performance	Recommended Product
Fixed Windows	<ul style="list-style-type: none"> • Total System U-value ≤ 2.9 • Total System SHGC = $0.57 \pm 10\%$ • Total System VLT = 0.64 	Aluminium framed, double glazed, argon filled, low-E, clear
Awning Windows	<ul style="list-style-type: none"> • Total System U-value ≤ 4.4 • Total System SHGC = $0.41 \pm 10\%$ • Total System VLT = 0.43 	Aluminium framed, double glazed, argon filled, low-E, clear
Sliding Doors	<ul style="list-style-type: none"> • Total System U-value ≤ 3.19 • Total System SHGC = $0.48 \pm 10\%$ • Total System VLT = 0.55 	Aluminium framed, double glazed, argon filled, low-E, clear

Walls	Thermal Performance (Added Insulation Value)	Recommended Product
Ext. Wall – Brick	R2.7 Bulk Insulation R0.4 Thermal Break	Bradford Gold Hi-performance Wall batts 90mm thick R2.7 with 20mm airspace and R0.4 non-combustible thermal break between framing and brick
Ext. Wall – Concrete	R2.7 Bulk Insulation R0.4 Thermal Break	Bradford Gold Hi-performance Wall batts 90mm thick R2.7 with 20mm airspace and R0.4 non-combustible thermal break between framing and brick
Int. Wall – Lift and Stair walls adjacent to conditioned spaces	R2.7 Bulk Insulation	Bradford Gold Hi-performance Wall batts 90mm thick R2.7 with 20mm airspace
Roofs	Thermal Performance	Recommended Product
Concrete Slab – where exposed above	R3.2 Soffit Insulation	Kingspan K10 G2 Soffit Board 70mm thick R3.2
Concrete Roof / Lightweight	TBC	TBC
Floors	Thermal Performance	Recommended Product
Concrete slab – where unconditioned or exposed below	R3.2 Soffit Insulation	Kingspan K10 G2 Soffit Board 70mm thick R3.2

Modelling Software

Simulation Package Software	DesignBuilder
Weather Data	Representative Meteorological Year (RMY) file for Melbourne

Reference Building Input Data

The following tables list the building thermal performance values applied within the reference model:

Walls	Description	Total R-Value
External Walls	Concrete (>80% WWR)	R1.0
	Brick (>80% WWR)	R1.0
Internal Walls	Concrete/Plasterboard	R2.8
Roof	Suspended Concrete	R3.2

Walls	Description	Total R-Value
Floor	Suspended Concrete	R2.0
Infiltration		0.7 Air Change per Hour (ac/h) when outdoor air is not mechanically supplied AND; 0.35 Air Change per Hour (ac/h) at all other times

The following table lists the glazing performance values required by the reference model.

Glazing	Total System U-value	Total System SHGC
Method 2 – Multiple Aspects	1.32	0.26

Building Services Inputs

The services have been modelled in accordance with the table below:

Services	Reference Building Services
Artificial lighting	NCC 2019 Section J Part J6.2 - Table 6.2a – Maximum Illumination Power Densities.
Cooling – Spaces conditioned	Assumed all SOUs, Lounges, Corridors, Staff Hub, and Pantry are conditioned.
Heating – Spaces conditioned	Assumed all SOUs, Lounges, Corridors, Staff Hub, and Pantry are conditioned.
Cooling – System type	VRV units specified modelled as air-to-air heat pump units with COP of 3.1 (per minimum MEPS requirements for split systems).
Heating – System type	VRV units specified modelled as air-to-air heat pump units with COP of 3.1 (per minimum MEPS requirements for split systems).
Services Operating Profile	Per NCC 2019 Section J – Specification JVc Table 2g. These profiles are modified in some instances to better represent the usage of certain spaces.
Heating and Cooling Setpoints	Cooling – 24°C Heating – 21°C
Airflow rates	Modelled in accordance with AS1668.

Activity Profiles

All zones include an activity profile which model occupancy, appliance and equipment, and associated operation profiles. The heat gains from these sources must be accounted for within the modelling. The same profiles are applied in all models per the requirements of Verification Method JV3. These can be summarised as follows:

Activity Profile Item	All Models
Occupant Density	Occupant density is per NCC Section D – Part D1.13 and AS1668.2-2012.
Occupancy Schedule	Per NCC 2019 Section J – Specification JVc Table 2g. These profiles are modified in some instances to better represent the usage of certain spaces.
Occupancy Heat Gains	Per NCC Section J – Specification JVc Table 2n.
Appliance Heat Gains	Per NCC Section J – Specification JVc Table 2l.
Appliance Schedule	Per NCC 2019 Section J – Specification JVc Table 2k. These profiles are modified in some instances to better represent the usage of certain spaces.

Results

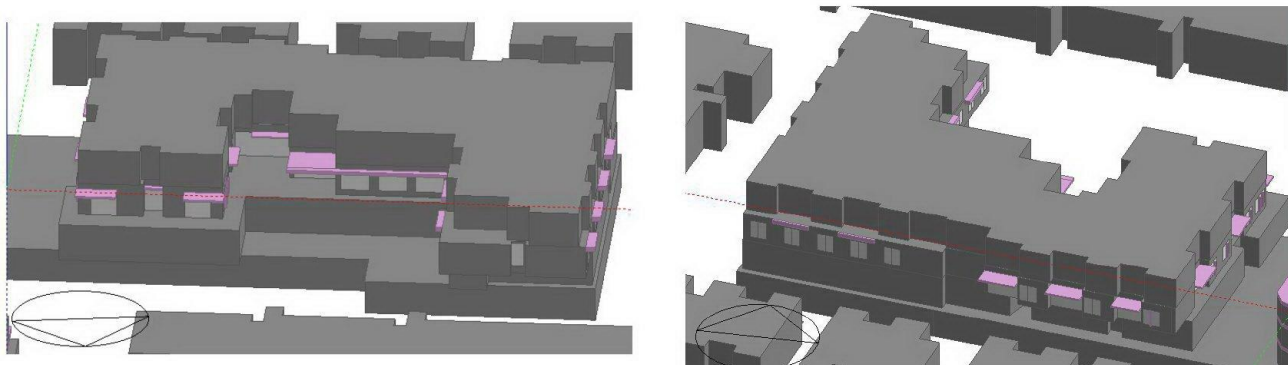


Figure 5 – Model of proposed building for energy simulations

The results below have been produced within the DesignBuilder software. These show that the proposed building (Model 2) emits less GHG than the reference building (Model 1).

	Model 1 – Reference Building (kg-CO ₂ eq/Annum)	Model 2 - Proposed Building with Reference Services (kg-CO ₂ eq/Annum)
Lighting	28,675	28,675
Heating (Electricity)	49,123	45,021
Cooling (Electricity)	6,184	7,936
TOTAL	83,982	81,633
GHG/yr/m ²	57.68	56.07

Appendix D: Renewable Energy

Peak Wattage of System	60.0 kWp
Azimuth	0 degrees
Inclination	10 degrees

Outputs Solar PV

Electricity Produced per Year	80,409 kWh
No. Panels Required	145
Total Roof Area Required	344 sqm
Annual Carbon Savings	90,058 kg CO ₂

Economic Output

Cost of System	90,000 \$
Annual Savings	16,082 \$
Simple Payback	6 Years

Appendix E: Daylight Modelling

Residential Daylight Modelling

Scope of Modelling

The preliminary residential daylight modelling for the ILAs has been undertaken assessing both living and bedroom areas. The 5off. sample ILAs have been selected with consideration of internal layout, inherent and adjacent building shading features. These ILAs reflect a worst-case scenario with all other units anticipated to achieve the BESS performance requirements.

The development has been modelled with all other intended buildings on site in place (villas and main building to the east, west, north, and south boundaries).

Methodology

The daylight levels in ILAs are benchmarked against the best practice requirements as set out under the Built Environment Sustainability Scorecard (BESS) tool: Indoor Environment Quality (IEQ) – Daylight Access Living Areas and Bedrooms. These levels are as follows:

“Dwellings should achieve the following daylight factors (DF)

- *80% of the total number of living rooms achieve a daylight factor greater than 1% to 90% of the floor area of each living area, including kitchens.*
- *80% of the total number of bedrooms achieve a daylight factor greater than 0.5% to 90% of the floor area in each room.”*

The daylight modelling has been completed using the Radiance software suite, an accurate computing program used to predict light levels in a space prior to construction. Scene geometric data and material properties are interfaced into the Radiance software using DesignBuilder.

Daylight Factor has been calculated using a CIE uniform cloudy sky.

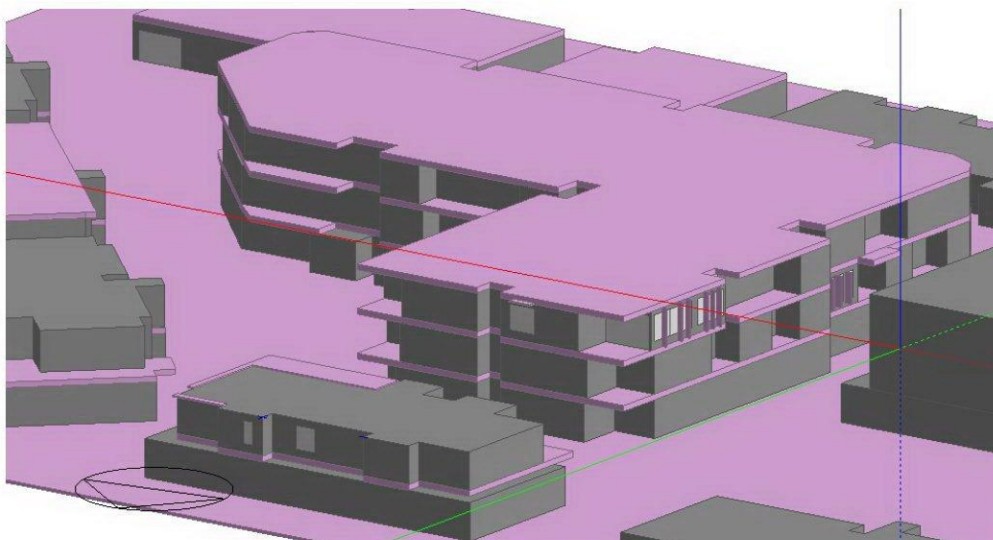


Figure 6 – DesignBuilder model of proposed buildings

Modelling Assumptions

The following assumptions have been made with respect to the modelling:

- Modelled window dimensions and shading structures are as depicted on the Architectural drawings.
- The glazing performance used for external windows is as follows:
 - Double glazed, low-e, clear window with a total system VLT of 0.59.
- The reflectance of all materials is in accordance with the below:
 - Floors: 0.3
 - Internal Walls: 0.7
 - Ceilings: 0.8
 - External Walls: 0.4
- Transient and unoccupied spaces such as corridors and wardrobes have been excluded from the modelled area.
- The reflectance of external buildings and structures is assumed to be 0.4.

Daylight Results – Numerical

The daylight results for living areas of 52 Golf Road, Oakleigh South can be summarised as follows:

Area	Floor Area (m2)	Floor Area above DF1 (m2)	% of floor area above DF1	Status
Sample 1	31.16	29.66	95.19	Compliant
Sample 2	39.20	19.68	50.20	Non-Compliant
Sample 3	39.81	39.31	98.74	Compliant
Sample 4	31.75	13.19	49.23	Non-Compliant
Sample 5	39.52	35.62	90.13	Compliant

The daylight results for bedrooms of 52 Golf Road, Oakleigh South can be summarised as follows:

Area	Floor Area (m2)	Floor Area above DF0.5 (m2)	% of floor area above DF0.5	Status
Sample 1 Bed 1	12.63	8.82	69.83	Non-Compliant
Sample 1 Bed 2	8.3	8.3	100	Compliant
Sample 2 Bed 1	11.22	11.22	100	Compliant
Sample 2 Bed 2	9.6	9.6	100	Compliant
Sample 3 Bed 1	8.96	8.96	100	Compliant
Sample 3 Bed 2	9.24	9.24	100	Compliant

Area	Floor Area (m2)	Floor Area above DF0.5 (m2)	% of floor area above DF0.5	Status
Sample 3 Bed 3	10.06	10.06	100	Compliant
Sample 4 Bed 1	12.58	12.58	100	Compliant
Sample 5 Bed 1	9.9	9.9	100	Compliant
Sample 5 Bed 2	8.9	8.9	100	Compliant
Sample 5 Bed 3	13.54	13.11	96.82	Compliant

Daylight Results – Visual

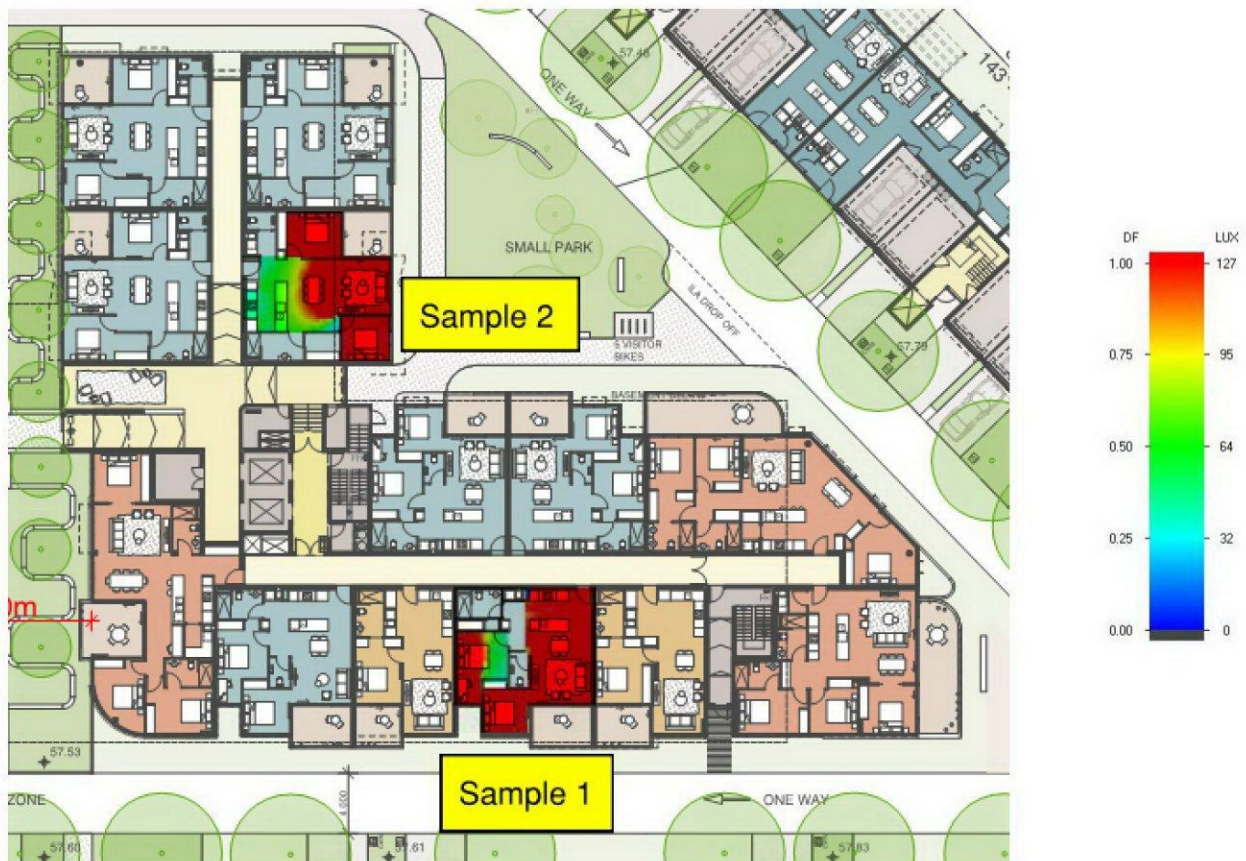


Figure 7 - Daylight Map – Ground Floor



Figure 8 - Daylight Map – First Floor



Figure 9 - Daylight Map – Second Floor

Overall Building Results

Apartment No.	Total Living Areas	Living Areas Compliant	Total Bedrooms	Bedrooms Compliant
Sample 1 Types	20	20	40	26
Sample 2 Types	4	0	12	12
Sample 3 Types	7	7	21	21
Sample 4 Types	6	2	6	6
Sample 5 Types	4	4	8	8
TOTAL	41	33	87	73
Percentage	80%		84%	

Conclusion

The development has been assessed and it has been determined that 80% of living areas and 84% of bedrooms will achieve the daylight factors as prescribed under BESS and therefore the development will meet the BESS IEQ guidelines for daylight.

Non-Residential Daylight Modelling

Scope of Modelling

We have undertaken daylight modelling for the first floor of the RAC/ALA building. This floor has been selected with consideration of internal layout, inherent and adjacent building shading features. This units represents an average of the village.

The RAC/ALA Building has been modelled under the proposed building scenario with single/double storey dwellings the north, south and west and the apartment building to the east.

Methodology

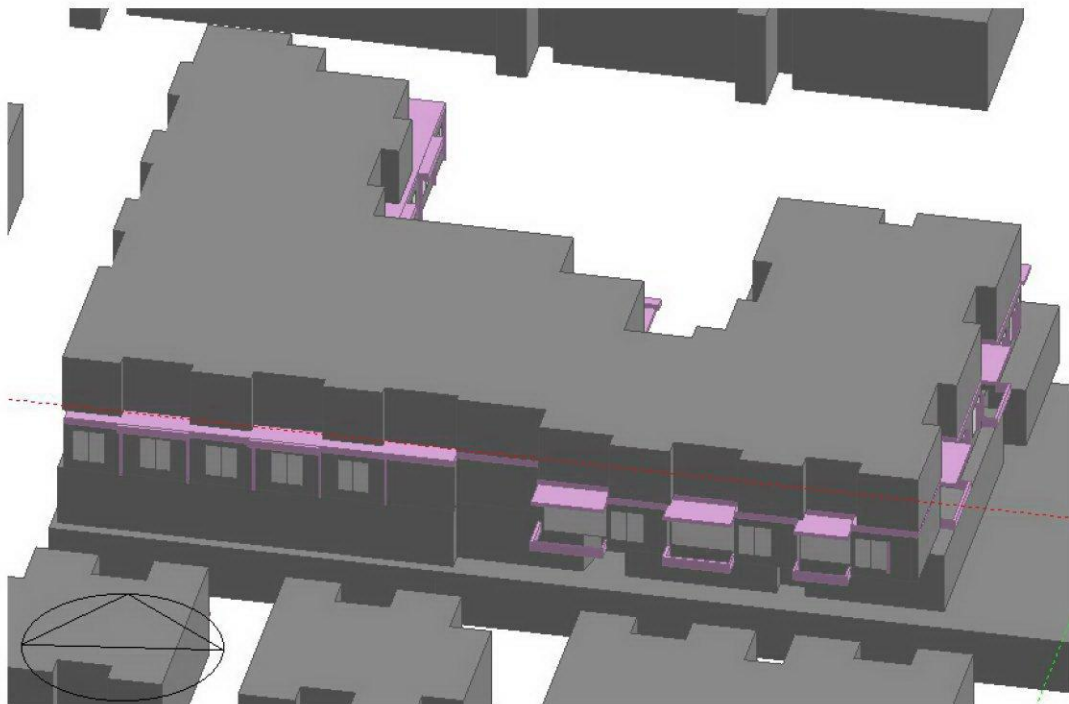
The daylight levels in the non-residential areas are benchmarked against the best practice requirements as set out under the Built Environment Sustainability Scorecard (BESS) tool: Indoor Environment Quality (IEQ) – Daylight Access Non-Residential. These levels are as follows:

The nominated areas are benchmarked against the following daylight factors (DF)

- *≥33% of the nominated floor area is to achieve a daylight factor greater than 2%.*

The daylight modelling has been completed using the Radiance software suite, an accurate computing program used to predict light levels in a space prior to construction. Scene geometric data and material properties are interfaced into the Radiance software using DesignBuilder.

Daylight Factor has been calculated using a CIE uniform cloudy sky.



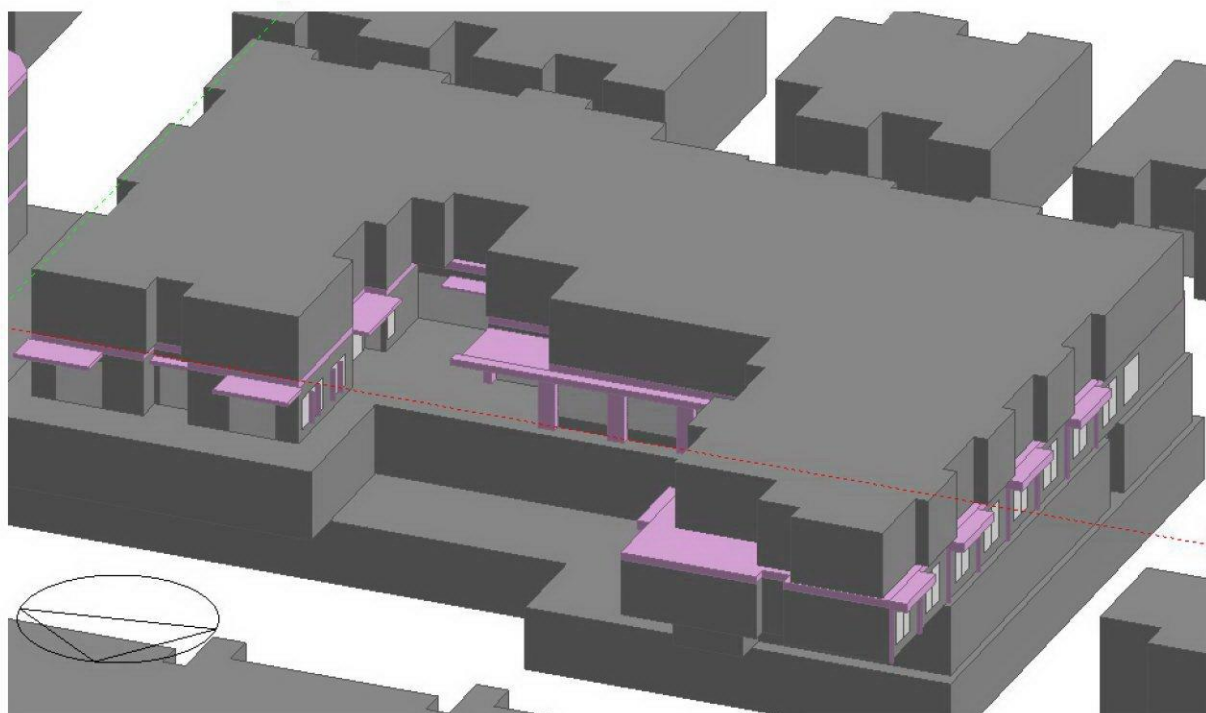


Figure 10 – DesignBuilder model of proposed building

Modelling Assumptions

The following assumptions have been made with respect to the modelling:

- Modelled window dimensions and shading structures are as depicted on the Architectural drawings.
- The glazing performance used for external windows is as follows:
 - Fixed windows: double glazed, low-e, clear window with a total system VLT of 0.64.
 - Awning windows: double glazed, low-e, clear window with a total system VLT of 0.43.
 - Sliding doors: double glazed, low-e, clear window with a total system VLT of 0.55.
- The reflectance of all materials is in accordance with the below:
 - Floors: 0.3
 - Internal Walls: 0.7
 - Ceilings: 0.8
 - External Walls: 0.4
- Transient and unoccupied spaces such as corridors and amenities have been excluded from the modelled area.
- The reflectance of external buildings and structures is assumed to be 0.4.

Daylight Results – Numerical

The daylight results for the nominated area of 52 Golf Road, Oakleigh South can be summarised as follows:

Area	Floor Area (m2)	Floor Area above DF2 (m2)	% of floor area above DF2
ALA-A 1B	11.68	8.2	70.21
ALA-A 1L	21.09	20.71	98.2
ALA-A 2B	11.31	9.75	86.21
ALA-A 2L	21.48	21.38	99.53
ALA-B 1B	11.23	2.31	20.57
ALA-B 1L	22.09	9.89	44.77
ALA-B 2B	12.51	9	71.94
ALA-B 2L	22.05	11.65	52.83
ALA-B 3B	10.63	9.35	87.96
ALA-B 3L	23.42	15.76	67.29
ALA-B 4B	10.72	10.23	95.43
ALA-B 4L	18.29	15.79	86.33
ALA-B 5B	11.07	10.69	96.57
ALA-B 5L	20.68	20.68	100
ALA-B 6B	10.09	9.93	98.41
ALA-B 6L	20.68	20.68	100
ILA Communal	37.59	21.65	57.6
RAC 1	13.68	11.59	84.72
RAC 2	13.89	13.19	94.96
RAC 3	13.68	11.72	85.67
RAC 4	13.68	13.18	96.35
RAC 5	14.04	11.93	84.97
RAC 6	14.04	13.49	96.08
RAC 7	14.76	12.17	82.45
RAC 8	12.96	12.9	99.54
RAC 9	11.84	11.09	93.67
RAC 10	12.8	11.86	92.66
RAC 11	12.16	11.26	92.6

Area	Floor Area (m2)	Floor Area above DF2 (m2)	% of floor area above DF2
RAC 12	12.8	11.9	92.97
RAC 13	11.84	11.28	95.27
RAC 14	13.29	8.1	60.95
RAC 15	13.26	8.45	63.73
RAC 16	13.26	10.79	81.37
RAC 17	12.92	9.06	70.12
RAC 18	12.92	9.76	75.54
RAC Communal	130.23	68.17	52.35
Total	664.66	499.54	75.16% (Compliant)

Daylight Results – Visual

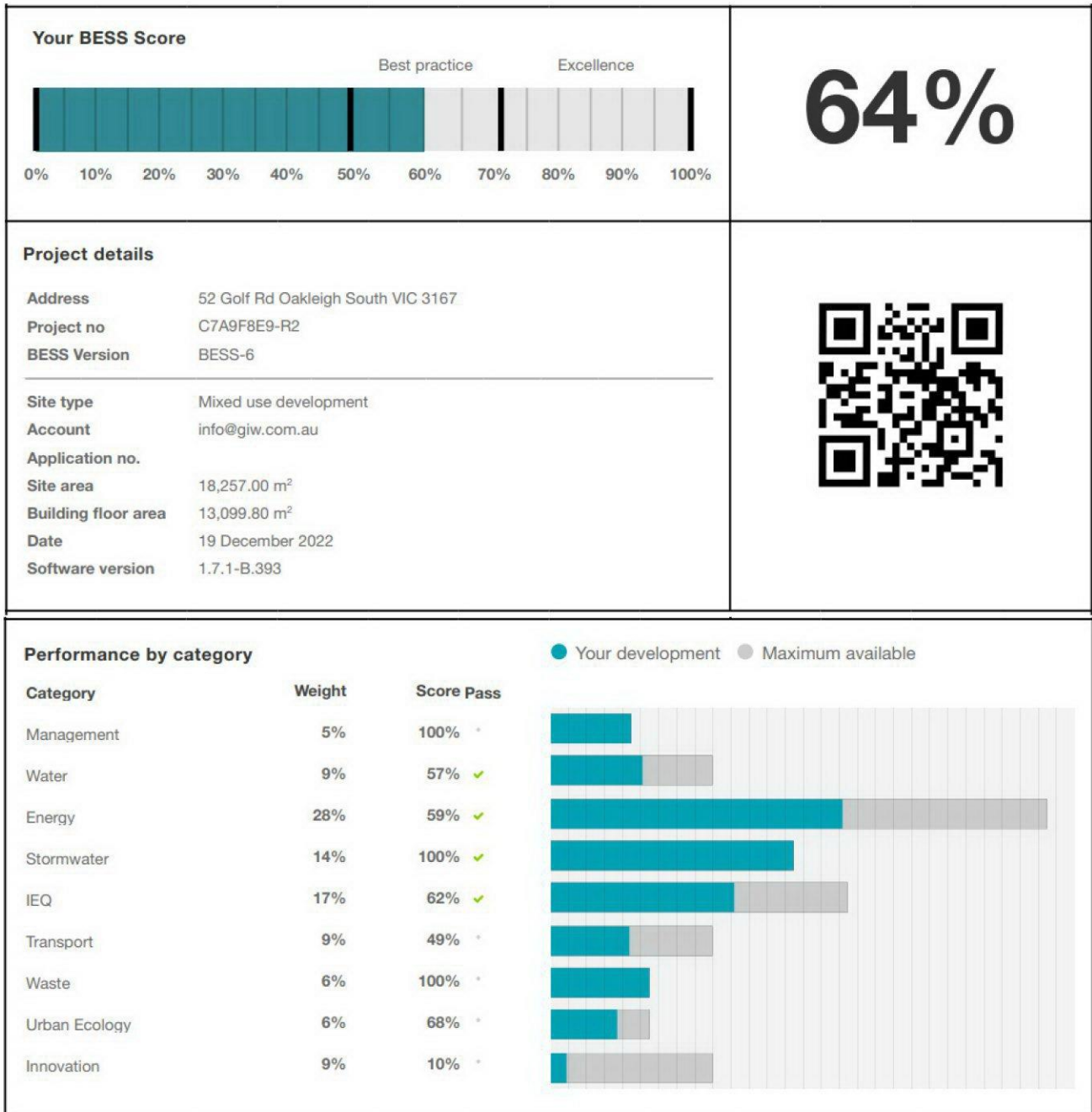


Figure 11 - Daylight Map – First Floor

Conclusion

The village has been assessed and it has been determined that 75% of the nominated floor area will achieve the daylight factors as prescribed under BESS and therefore the village will exceed the BESS IEQ guidelines for daylight.

Appendix F: BESS Assessment



BESS Report

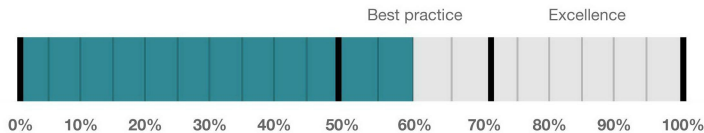
Built Environment Sustainability Scorecard



This BESS report outlines the sustainable design commitments of the proposed development at 52 Golf Rd Oakleigh South VIC 3167. The BESS report and accompanying documents and evidence are submitted in response to the requirement for a Sustainable Design Assessment or Sustainability Management Plan at Monash City Council.

Note that where a Sustainability Management Plan is required, the BESS report must be accompanied by a report that further demonstrates the development's potential to achieve the relevant environmental performance outcomes and documents the means by which the performance outcomes can be achieved.

Your BESS Score



64%

Project details

Address 52 Golf Rd Oakleigh South VIC 3167
Project no C7A9F8E9-R2
BESS Version BESS-6

Site type Mixed use development
Account info@giv.com.au
Application no.
Site area 18,257.00 m²
Building floor area 13,099.80 m²
Date 19 December 2022
Software version 1.7.1-B.393



Performance by category

● Your development ● Maximum available

Category	Weight	Score Pass	Progress
Management	5%	100% *	100%
Water	9%	57% ✓	57%
Energy	28%	59% ✓	59%
Stormwater	14%	100% ✓	100%
IEQ	17%	62% ✓	62%
Transport	9%	49% *	49%
Waste	6%	100% *	100%
Urban Ecology	6%	68% *	68%
Innovation	9%	10% *	10%

Buildings

Name	Height	Footprint	% of total footprint
Villa	2	4,120 m ²	56%
APT	3	1,655 m ²	22%
ALA & RAC	3	1,481 m ²	20%

Dwellings & Non Res Spaces

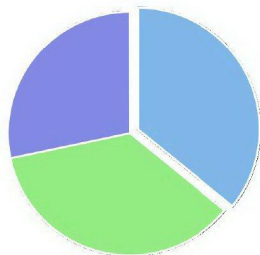
Dwellings

Name	Quantity	Area	Building	% of total area
Townhouse				
2B Villa	38	88.5 m ²	Villa	25%
3B Villa	12	111 m ²	Villa	10%
Total	50	4,696 m²	35%	
Apartment				
2B ILA	24	84.4 m ²	APT	15%
3B ILA	6	119 m ²	APT	5%
3B ILA	5	119 m ²	APT	4%
1B ILA	6	62.0 m ²	APT	2%
Total	41	3,706 m²	28%	

Non-Res Spaces

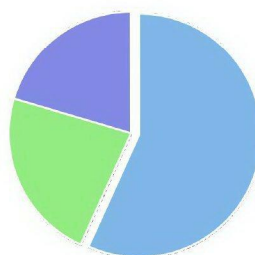
Name	Quantity	Area	Building	% of total area
Other building				
RAC & ALA	1	4,697 m ²	ALA & RAC	35%
Total	1	4,697 m²	35%	

Building Type composition



● Other building ● Townhouse ● Apartment

Building composition



● Villa ● APT ● ALA & RAC

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 3.3	External lighting sensors annotated		-
Energy 3.4	Clothes line annotated (if proposed)		-
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		-
IEQ 2.2	Dwellings meeting the requirements for having 'natural cross flow ventilation'		-
IEQ 3.1	Glazing specification to be annotated		-
IEQ 3.2	Adjustable shading systems		-
IEQ 3.3	North-facing living areas		-
Transport 1.2	All nominated residential visitor bicycle parking spaces		-
Transport 1.5	All nominated non-residential visitor bicycle parking spaces		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Transport 2.3	All nominated motorbicycle parking spaces		-
Waste 2.1	Location of food and garden waste facilities		-
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 3.1	Food production areas		-
Urban Ecology 3.2	Food production areas		-



Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Management 2.3a	Section J glazing assessment		-
Management 2.3b	Preliminary modelling report		-
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 3.5	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 3.6	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).		-

Credit	Requirement	Response	Status
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		-
IEQ 2.2	A list of dwellings with natural cross flow ventilation		-
IEQ 3.1	Reference to floor plans or energy modelling showing the glazing specification (U-value and Solar Heat Gain Coefficient, SHGC)		-
IEQ 3.2	Reference to floor plans and elevations showing shading devices		-
IEQ 3.3	Reference to the floor plans showing living areas orientated to the north.		-

Credit summary

Management Overall contribution 4.5%

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

Water Overall contribution 9.0%

		Minimum required 50%	57%	✔ Pass
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%

		Minimum required 50%	59%	✔ Pass
1.1 Thermal Performance Rating - Non-Residential			12%	
1.2 Thermal Performance Rating - Residential			50%	
2.1 Greenhouse Gas Emissions			100%	
2.2 Peak Demand			0%	
2.3 Electricity Consumption			100%	
2.4 Gas Consumption			N/A	✦ Scoped Out
		No gas connection in use		
2.5 Wood Consumption			N/A	✦ Scoped Out
		No wood heating system present		
3.1 Carpark Ventilation			100%	
3.2 Hot Water			35%	
3.3 External Lighting			100%	
3.4 Clothes Drying			55%	
3.5 Internal Lighting - Residential Single Dwelling			100%	
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			0%	⊘ Disabled
		No other (non-solar PV) renewable energy is in use.		
4.5 Solar PV - Houses and Townhouses			0%	

Stormwater Overall contribution 13.5%

		Minimum required 100%	100%	✔ Pass
1.1 Stormwater Treatment			100%	

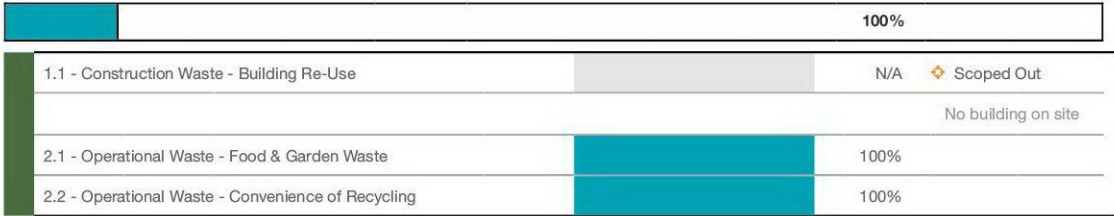
IEQ Overall contribution 16.5%

		Minimum required 50%	62%	✓ Pass
1.1	Daylight Access - Living Areas		66%	
1.2	Daylight Access - Bedrooms		66%	
1.3	Winter Sunlight		0%	
1.4	Daylight Access - Non-Residential		75%	✓ Achieved
1.5	Daylight Access - Minimal Internal Bedrooms		100%	
2.1	Effective Natural Ventilation		0%	
2.2	Cross Flow Ventilation		100%	
2.3	Ventilation - Non-Residential		33%	✓ Achieved
3.1	Thermal comfort - Double Glazing		100%	
3.2	Thermal Comfort - External Shading		100%	
3.3	Thermal Comfort - Orientation		100%	
3.4	Thermal comfort - Shading - Non-residential		66%	
3.5	Thermal Comfort - Ceiling Fans - Non-Residential		0%	
4.1	Air Quality - Non-Residential		100%	

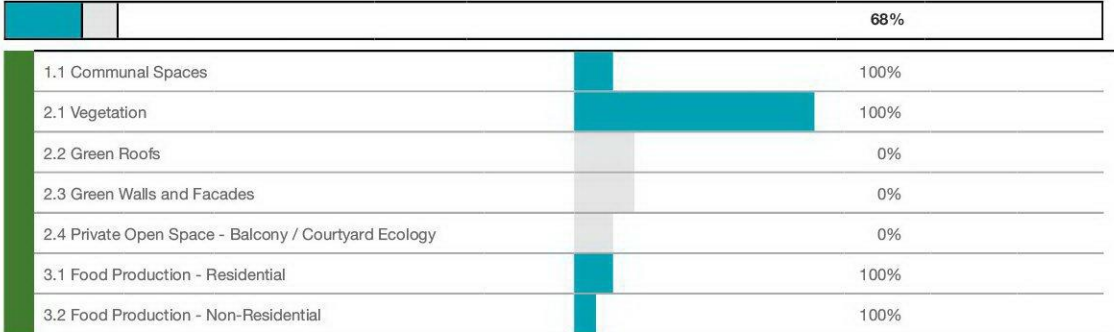
Transport Overall contribution 9.0%

			49%	
1.1	Bicycle Parking - Residential		0%	
1.2	Bicycle Parking - Residential Visitor		55%	
1.3	Bicycle Parking - Convenience Residential		0%	⊘ Disabled
		Credit 1.1 must be achieved first.		
1.4	Bicycle Parking - Non-Residential		0%	
1.5	Bicycle Parking - Non-Residential Visitor		100%	
1.6	End of Trip Facilities - Non-Residential		0%	⊘ Disabled
		Credit 1.4 must be complete first.		
2.1	Electric Vehicle Infrastructure		100%	
2.2	Car Share Scheme		0%	
2.3	Motorbikes / Mopeds		100%	

Waste Overall contribution 5.5%



Urban Ecology Overall contribution 5.5%



Innovation Overall contribution 9.0%



Credit breakdown

Management Overall contribution 4%

1.1 Pre-Application Meeting	100%
Score Contribution	This credit contributes 41.2% 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	Yes
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
Score Contribution	This credit contributes 17.6% towards the category score.
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?
Question	Criteria Achieved ?
Townhouse	Yes
Apartment	Yes
2.3 Thermal Performance Modelling - Non-Residential	100%
Score Contribution	This credit contributes 9.8% towards the category score.
Criteria	Has a preliminary facade assessment been undertaken in accordance with NCC2019 Section J1.5?
Question	Criteria Achieved ?
Other building	Yes
Criteria	Has preliminary modelling been undertaken in accordance with either NCC2019 Section J (Energy Efficiency), NABERS or Green Star?
Question	Criteria Achieved ?
Other building	Yes
3.1 Metering - Residential	100%
Score Contribution	This credit contributes 3.9% towards the category score.
Criteria	Have utility meters been provided for all individual dwellings?
Question	Criteria Achieved ?
Apartment	Yes
3.2 Metering - Non-Residential	100%
Score Contribution	This credit contributes 4.9% towards the category score.
Criteria	Have utility meters been provided for all individual commercial tenants?
Question	Criteria Achieved ?
Other building	Yes

3.3 Metering - Common Areas

100%

Score Contribution	This credit contributes 8.8% towards the category score.
Criteria	Have all major common area services been separately submetered?
Question	Criteria Achieved ?
Apartment	Yes
Other building	Yes

4.1 Building Users Guide

100%

Score Contribution	This credit contributes 13.7% 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%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
Project Water Profile Question	
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
Water fixtures, fittings and connections	
Building:	
1B ILA	APT
2B ILA	
3B ILA	
3B ILA	
2B Villa	Villa
3B Villa	
RAC & ALA	ALA & RAC
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: All	>= 5 Star WELS rating
WC: All	>= 4 Star WELS rating
Urinals: All	Scope out
Washing Machine Water Efficiency: All	Occupant to Install
Which non-potable water source is the dwelling/space connected to?:	
1B ILA	ILA RWT
2B ILA	
3B ILA	
3B ILA	
2B Villa	-1
3B Villa	
RAC & ALA	RAC & ALA RWT
Non-potable water source connected to Toilets:	
1B ILA	Yes
2B ILA	
3B ILA	
3B ILA	
2B Villa	No
3B Villa	
RAC & ALA	

Non-potable water source connected to Laundry (washing machine):	
1B ILA	No
2B ILA	
3B ILA	
3B ILA	
2B Villa	
3B Villa	
RAC & ALA	Yes
Non-potable water source connected to Hot Water System: All No	
Rainwater Tanks	
What is the total roof area connected to the rainwater tank?:	
RAC & ALA RWT	1,481 m ²
ILA RWT	1,652 m ²
Tank Size:	
RAC & ALA RWT	20,000 Litres
ILA RWT	20,000 Litres
Irrigation area connected to tank:	
RAC & ALA RWT	731 m ²
ILA RWT	852 m ²
Is connected irrigation area a water efficient garden?:	
RAC & ALA RWT	Yes
ILA RWT	Yes
Other external water demand connected to tank?:	
RAC & ALA RWT	-
ILA RWT	-

1.1 Potable water use reduction	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	24522 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	20127 kL
Output	Proposed (including rainwater and recycled water use)
Project	18305 kL
Output	% Reduction in Potable Water Consumption
Project	25 %
Output	% of connected demand met by rainwater
Project	48 %
Output	How often does the tank overflow?
Project	Very Often
Output	Opportunity for additional rainwater connection
Project	9185 kL
3.1 Water Efficient Landscaping	100%
Score Contribution	This credit contributes 14.3% towards the category score.
Criteria	Will water efficient landscaping be installed?
Question	Criteria Achieved ?
Project	Yes
4.1 Building Systems Water Use Reduction	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 16% Minimum required 50%

Use the BESS Deem to Satisfy (DtS) method for Energy?:	No
Dwellings Energy Approach	
What approach do you want to use for Energy?:	Use the built in calculation tools
Project Energy Profile Question	
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Gas supplied into building:	No gas connection
Dwelling Energy Profiles	
Building:	
1B ILA	APT
2B ILA	
3B ILA	
3B ILA	
2B Villa	Villa
3B Villa	
Below the floor is:	
1B ILA	Another Occupancy
2B ILA	
3B ILA	
3B ILA	
2B Villa	Ground or Carpark
3B Villa	
Above the ceiling is:	
1B ILA	Another Occupancy
2B ILA	
3B ILA	
3B ILA	
2B Villa	Outside
3B Villa	
Exposed sides:	
1B ILA	2
2B ILA	
3B ILA	
3B ILA	
2B Villa	3
3B Villa	
NatHERS Annual Energy Loads - Heat: All	62.4 MJ/sqm
NatHERS Annual Energy Loads - Cool: All	13.4 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	A Electric Storage

% Contribution from solar hot water system: All	-
Is the hot water system shared by multiple dwellings?: All	Yes
Clothes Line:	
1B ILA	A No drying facilities
2B ILA	
3B ILA	
3B ILA	
2B Villa	D Private outdoor clothesline
3B Villa	
Clothes Dryer: All	Occupant to Install



Non-Residential Building Energy Profile

Heating, Cooling & Comfort Ventilation - Electricity - reference fabric and reference services:	47,678 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and reference services:	45,653 kWh
Heating, Cooling & Comfort Ventilation - Electricity - proposed fabric and proposed services:	45,653 kWh
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:	1,000 kWh
Hot Water - Electricity - Proposed:	1,000 kWh
Lighting - Baseline:	24,720 kWh
Lighting - Proposed:	24,720 kWh
Peak Thermal Cooling Load - Baseline:	-
Peak Thermal Cooling Load - Proposed:	-



Solar Photovoltaic systems

System Size (lesser of inverter and panel capacity):	
TH PV	40.0 kW peak
ILA	10.0 kW peak
ALA & RAC	5.0 kW peak
Orientation (which way is the system facing?):	
TH PV	North
ILA	North
ALA & RAC	North
Inclination (angle from horizontal):	
TH PV	10.0 Angle (degrees)
ILA	10.0 Angle (degrees)
ALA & RAC	10.0 Angle (degrees)
Which Building Class does this apply to?:	
TH PV	Townhouse
ILA	Apartment
ALA & RAC	Other building

1.1 Thermal Performance Rating - Non-Residential	12%
Score Contribution	This credit contributes 14.5% towards the category score.
Criteria	What is the % reduction in heating and cooling energy consumption against the reference case (NCC 2019 Section J)?
Output	Total Improvement
Other building	4 %
1.2 Thermal Performance Rating - Residential	50%
Score Contribution	This credit contributes 19.5% towards the category score.
Criteria	What is the average NatHERS rating?
Output	Average NATHERS Rating (Weighted)
Townhouse	6.9 Stars
Apartment	6.9 Stars
2.1 Greenhouse Gas Emissions	100%
Score Contribution	This credit contributes 10.1% 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)
Townhouse	402,831 kg CO ₂
Apartment	297,379 kg CO ₂
Other building	49,652 kg CO ₂
Output	Proposed Building with Proposed Services (Actual Building)
Townhouse	250,170 kg CO ₂
Apartment	214,641 kg CO ₂
Other building	47,586 kg CO ₂
Output	% Reduction in GHG Emissions
Townhouse	37 %
Apartment	27 %
Other building	4 %
2.2 Peak Demand	0%
Score Contribution	This credit contributes 5.1% towards the category score.
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?
Output	Peak Thermal Cooling Load - Baseline
Townhouse	607 kW
Apartment	479 kW
Output	Peak Thermal Cooling Load - Proposed
Townhouse	562 kW
Apartment	445 kW
Output	Peak Thermal Cooling Load - % Reduction
Townhouse	7 %
Apartment	7 %

2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 10.1% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Townhouse	394,932 kWh	
Apartment	291,548 kWh	
Other building	48,678 kWh	
Output	Proposed	
Townhouse	245,264 kWh	
Apartment	210,433 kWh	
Other building	46,653 kWh	
Output	Improvement	
Townhouse	37 %	
Apartment	27 %	
Other building	4 %	
2.4 Gas Consumption		N/A  Scoped Out
This credit was scoped out	No gas connection in use	
2.5 Wood Consumption		N/A  Scoped Out
This credit was scoped out	No wood heating system present	
3.1 Carpark Ventilation		100%
Score Contribution	This credit contributes 10.1% 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	

3.2 Hot Water	35%
Score Contribution	This credit contributes 5.1% 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
Townhouse	150,074 kWh
Apartment	120,090 kWh
Other building	1,000 kWh
Output	Proposed
Townhouse	191,227 kWh
Apartment	154,575 kWh
Other building	1,000 kWh
Output	Improvement
Townhouse	-28 %
Apartment	-29 %
Other building	0 %
3.3 External Lighting	100%
Score Contribution	This credit contributes 1.8% towards the category score.
Criteria	Is the external lighting controlled by a motion detector?
Question	Criteria Achieved ?
Townhouse	Yes
3.4 Clothes Drying	55%
Score Contribution	This credit contributes 3.3% 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
Townhouse	26,769 kWh
Apartment	21,293 kWh
Output	Proposed
Townhouse	5,354 kWh
Apartment	21,293 kWh
Output	Improvement
Townhouse	80 %
Apartment	0 %
3.5 Internal Lighting - Residential Single Dwelling	100%
Score Contribution	This credit contributes 1.8% towards the category score.
Criteria	Does the development achieve a maximum illumination power density of 4W/sqm or less?
Question	Criteria Achieved?
Townhouse	Yes

3.6 Internal Lighting - Residential Multiple Dwellings		100%
Score Contribution	This credit contributes 2.9% towards the category score.	
Criteria	Is the maximum illumination power density (W/m ²) 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	
3.7 Internal Lighting - Non-Residential		100%
Score Contribution	This credit contributes 3.6% towards the category score.	
Criteria	Does the maximum illumination power density (W/m ²) 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 ?	
Other building	Yes	
4.1 Combined Heat and Power (cogeneration / trigeneration)		N/A  Scoped Out
This credit was scoped out	No cogeneration or trigeneration system in use.	
4.2 Renewable Energy Systems - Solar		100%
Score Contribution	This credit contributes 3.3% 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	12,118 kWh	
Other building	6,059 kWh	
Output	% of Building's Energy	
Apartment	5 %	
Other building	8 %	
4.4 Renewable Energy Systems - Other		0%  Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.	
4.5 Solar PV - Houses and Townhouses		0%
Score Contribution	This credit contributes 3.6% 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	
Townhouse	48,473 kWh	
Output	% of Building's Energy	
Townhouse	19 %	

Stormwater Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:		MUSIC or other modelling software
1.1 Stormwater Treatment		100%
Score Contribution	This credit contributes 100.0% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	Flow (ML/year)	
Project	10.0 % Reduction	
Question	Total Suspended Solids (kg/year)	
Project	80.0 % Reduction	
Question	Total Phosphorus (kg/year)	
Project	45.0 % Reduction	
Question	Total Nitrogen (kg/year)	
Project	45.0 % Reduction	

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?:	Provide our own calculations	
1.1 Daylight Access - Living Areas		66%
Score Contribution	This credit contributes 7.3% towards the category score.	
Criteria	What % of living areas achieve a daylight factor greater than 1%	
Question	Percentage Achieved ?	
Apartment	80 %	
1.2 Daylight Access - Bedrooms		66%
Score Contribution	This credit contributes 7.3% towards the category score.	
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%	
Question	Percentage Achieved ?	
Apartment	84 %	
1.3 Winter Sunlight		0%
Score Contribution	This credit contributes 2.4% 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	
1.4 Daylight Access - Non-Residential		75% ✔ Achieved
Score Contribution	This credit contributes 18.5% towards the category score.	
Criteria	What % of the nominated floor area has at least 2% daylight factor?	
Question	Percentage Achieved?	
Other building	75 %	
1.5 Daylight Access - Minimal Internal Bedrooms		100%
Score Contribution	This credit contributes 2.4% towards the category score.	
Criteria	Do at least 90% of dwellings have an external window in all bedrooms?	
Question	Criteria Achieved ?	
Apartment	Yes	
2.1 Effective Natural Ventilation		0%
Score Contribution	This credit contributes 7.3% towards the category score.	
Criteria	What % of dwellings are effectively naturally ventilated?	
Question	Percentage Achieved?	
Apartment	41 %	

2.2 Cross Flow Ventilation	100%
Score Contribution	This credit contributes 3.1% towards the category score.
Criteria	Are all habitable rooms designed to achieve natural cross flow ventilation?
Question	Criteria Achieved ?
Townhouse	Yes
2.3 Ventilation - Non-Residential	33% ✔ Achieved
Score Contribution	This credit contributes 18.5% towards the category score.
Criteria	What % of the regular use areas are effectively naturally ventilated?
Question	Percentage Achieved?
Other building	-
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?
Other building	50 %
Criteria	What CO2 concentrations are the ventilation systems designed to achieve, to monitor and to maintain?
Question	Value
Other building	0 ppm
3.1 Thermal comfort - Double Glazing	100%
Score Contribution	This credit contributes 6.2% towards the category score.
Criteria	Is double glazing (or better) used to all habitable areas?
Question	Criteria Achieved ?
Townhouse	Yes
3.2 Thermal Comfort - External Shading	100%
Score Contribution	This credit contributes 3.1% towards the category score.
Criteria	Is appropriate external shading provided to east, west and north facing glazing?
Question	Criteria Achieved ?
Townhouse	Yes
3.3 Thermal Comfort - Orientation	100%
Score Contribution	This credit contributes 3.1% towards the category score.
Criteria	Are at least 50% of living areas orientated to the north?
Question	Criteria Achieved ?
Townhouse	Yes
3.4 Thermal comfort - Shading - Non-residential	66%
Score Contribution	This credit contributes 9.2% towards the category score.
Criteria	What percentage of east, north and west glazing to regular use areas is effectively shaded?
Question	Percentage Achieved?
Other building	50 %

3.5 Thermal Comfort - Ceiling Fans - Non-Residential		0%
Score Contribution	This credit contributes 3.1% towards the category score.	
Criteria	What percentage of regular use areas in tenancies have ceiling fans?	
Question	Percentage Achieved?	
Other building	0 %	
4.1 Air Quality - Non-Residential		100%
Score Contribution	This credit contributes 8.6% 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	Yes	
Criteria	Does all engineered wood meet the maximum total indoor pollutant emission limits?	
Question	Criteria Achieved ?	
Project	Yes	

Transport Overall contribution 4%

1.1 Bicycle Parking - Residential	0%
Score Contribution	This credit contributes 15.5% towards the category score.
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?
Question	Bicycle Spaces Provided ?
Townhouse	10
Apartment	0
Output	Min Bicycle Spaces Required
Townhouse	50
1.2 Bicycle Parking - Residential Visitor	55%
Score Contribution	This credit contributes 15.5% towards the category score.
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?
Question	Visitor Bicycle Spaces Provided ?
Townhouse	10
Apartment	5
Output	Min Visitor Bicycle Spaces Required
Townhouse	10
Apartment	9
1.3 Bicycle Parking - Convenience Residential	0% <input type="checkbox"/> Disabled
This credit is disabled	Credit 1.1 must be achieved first.
1.4 Bicycle Parking - Non-Residential	0%
Score Contribution	This credit contributes 8.7% 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 ?
Other building	No
Question	Bicycle Spaces Provided ?
Other building	0
1.5 Bicycle Parking - Non-Residential Visitor	100%
Score Contribution	This credit contributes 4.3% 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 ?
Other building	Yes
Question	Bicycle Spaces Provided ?
Other building	3
1.6 End of Trip Facilities - Non-Residential	0% <input type="checkbox"/> Disabled
This credit is disabled	Credit 1.4 must be complete first.

2.1 Electric Vehicle Infrastructure	100%
Score Contribution	This credit contributes 24.1% towards the category score.
Criteria	Are facilities provided for the charging of electric vehicles?
Question	Criteria Achieved ?
Project	Yes
2.2 Car Share Scheme	0%
Score Contribution	This credit contributes 12.1% towards the category score.
Criteria	Has a formal car sharing scheme been integrated into the development?
Question	Criteria Achieved ?
Project	No
2.3 Motorbikes / Mopeds	100%
Score Contribution	This credit contributes 12.1% 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)?
Annotation	Included for scooter parking spaces.
Question	Criteria Achieved ?
Project	Yes

Waste Overall contribution 6%

1.1 - Construction Waste - Building Re-Use	N/A	 Scoped Out
This credit was scoped out	No building on site	
2.1 - Operational Waste - Food & Garden Waste	100%	
Score Contribution	This credit contributes 50.0% towards the category score.	
Criteria	Are facilities provided for on-site management of food and garden waste?	
Question	Criteria Achieved ?	
Project	Yes	
2.2 - Operational Waste - Convenience of Recycling	100%	
Score Contribution	This credit contributes 50.0% 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%

1.1 Communal Spaces	100%
Score Contribution	This credit contributes 7.7% towards the category score.
Criteria	Is there at least the following amount of common space measured in square meters : * 1m ² for each of the first 50 occupants * Additional 0.5m ² for each occupant between 51 and 250 * Additional 0.25m ² for each occupant above 251?
Question	Common space provided
Apartment	70.0 m ²
Other building	142 m ²
Output	Minimum Common Space Required
Apartment	70 m ²
Other building	142 m ²
2.1 Vegetation	100%
Score Contribution	This credit contributes 48.3% 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	30 %
2.2 Green Roofs	0%
Score Contribution	This credit contributes 12.1% towards the category score.
Criteria	Does the development incorporate a green roof?
Question	Criteria Achieved ?
Project	No
2.3 Green Walls and Facades	0%
Score Contribution	This credit contributes 12.1% towards the category score.
Criteria	Does the development incorporate a green wall or green façade?
Question	Criteria Achieved ?
Project	No
2.4 Private Open Space - Balcony / Courtyard Ecology	0%
Score Contribution	This credit contributes 7.7% towards the category score.
Criteria	Is there a tap and floor waste on every balcony / in every courtyard?
Question	Criteria Achieved ?
Townhouse	No
Apartment	No

3.1 Food Production - Residential		100%
Score Contribution	This credit contributes 7.7% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Townhouse	29.0 m ²	
Apartment	23.0 m ²	
Output	Min Food Production Area	
Townhouse	29 m ²	
Apartment	23 m ²	
3.2 Food Production - Non-Residential		100%
Score Contribution	This credit contributes 4.3% towards the category score.	
Criteria	What area of space per occupant is dedicated to food production?	
Question	Food Production Area	
Other building	59.0 m ²	
Output	Min Food Production Area	
Other building	59 m ²	

Innovation Overall contribution 1%

Innovation		
Description:	ESD Verification during Construction	Verification that ESD initiatives have been applied
Points Targeted:	ESD Verification during Construction	1
1.1 Innovation		10%
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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