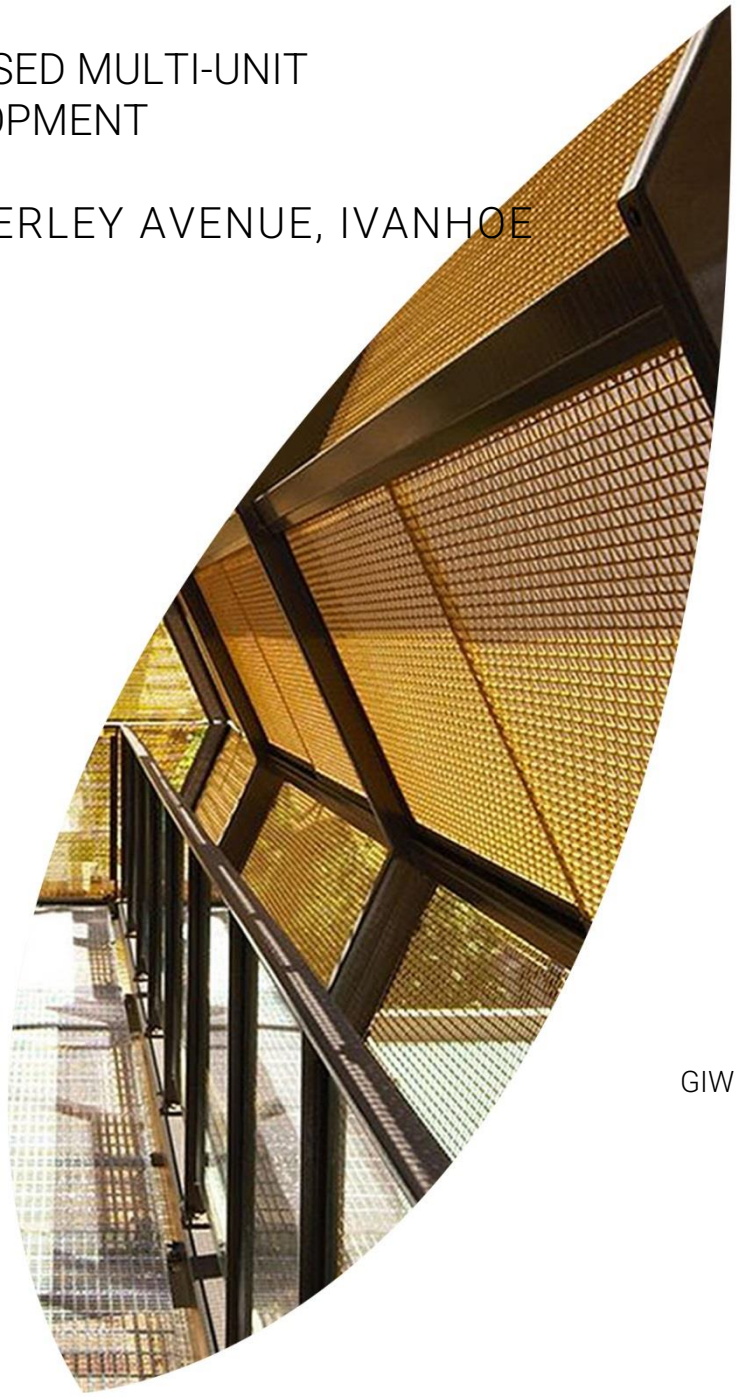
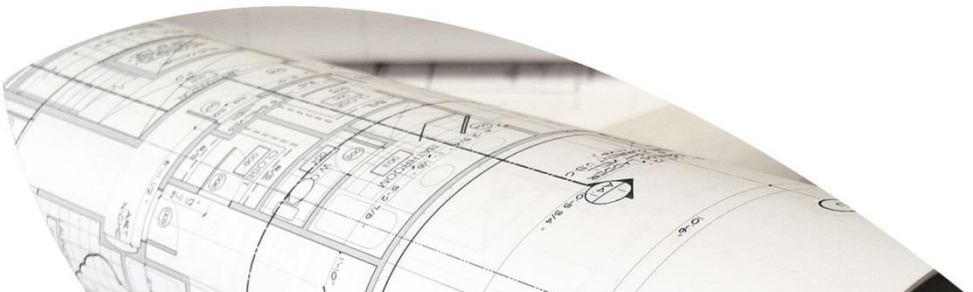
SUSTAINABLE MANAGEMENT PLAN

PROPOSED MULTI-UNIT DEVELOPMENT

3 WAVERLEY AVENUE, IVANHOE





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Revision H

Prepared for:
KUD

30 October 2024

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Revision History

Revision Number	Date Issued	Author	Approved	Comments
A	16/06/2023	KE	IB	Draft
B	30/06/2023	KE	IB	Final
C	04/07/2023	KE	IB	Final
D	06/09/2023	KE	IB	RFI Submission
E	12/10/2023	KE	IB	RFI Submission Amendment
F	20/10/2023	KE	IB	RFI Submission Amendment
G	11/10/2024	KE	IB	Amended Application
H	30/10/2024	KE	IB	Updated Final

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Contents

1. Introduction

Project Information

GIW Environmental Solutions Pty Ltd ("GIW") has been engaged by KUD to provide Environmentally Sustainable Design (ESD) consulting services for the proposed multi-dwelling development at 3 Waverley Avenue, Ivanhoe.

The proposed development will include 10 apartments constructed over 3 levels plus basement carpark and will consist of the following:

- 10 x 3-bedroom apartments

The site located at 3 Waverley Avenue, Ivanhoe has an approximate surface area of 1,269m^2 and is currently the location of single residential dwelling. Distance from the site to Melbourne CBD is approximately 12km.

Figure 1 - Pre-existing sites at 3 Waverley Avenue, Ivanhoe.

Statutory Requirements

This Sustainable Management Plan (SMP) has been prepared to inform City of Banyule 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 Banyule Planning Scheme - Clause 22.05 Environmentally Sustainable Development.

Development Type	Application Requirement	Example Tools
Development of 10 or more dwellings.	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:

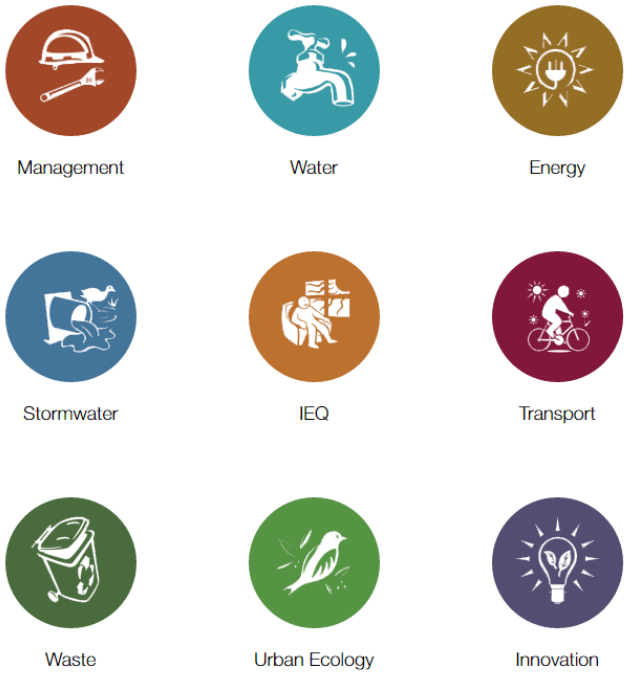


Figure 2 - BESS Environmental Categories (www.bess.net.au)

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

KUD 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:

- KUD – Project No. 22-022 – Drawing No. TP002 Rev A; TP100 Rev A, TP200 Rev A; TP300-TP304 Rev A; TP306-TP308 Rev A; TP400-TP402 Rev B; TP500-TP501 Rev A; TP600-TP603 Rev A; TP650-TP652 Rev A; TP660-TP665 Rev A, TP700-TP706 Rev A.
- Municipal Association of Victoria - SDAPP Explained; Building Design for a Sustainable Future
- Built Environment Sustainability Scorecard (BESS)
- CSIRO 1999, Urban Stormwater – Best Practise Environmental Management Guidelines

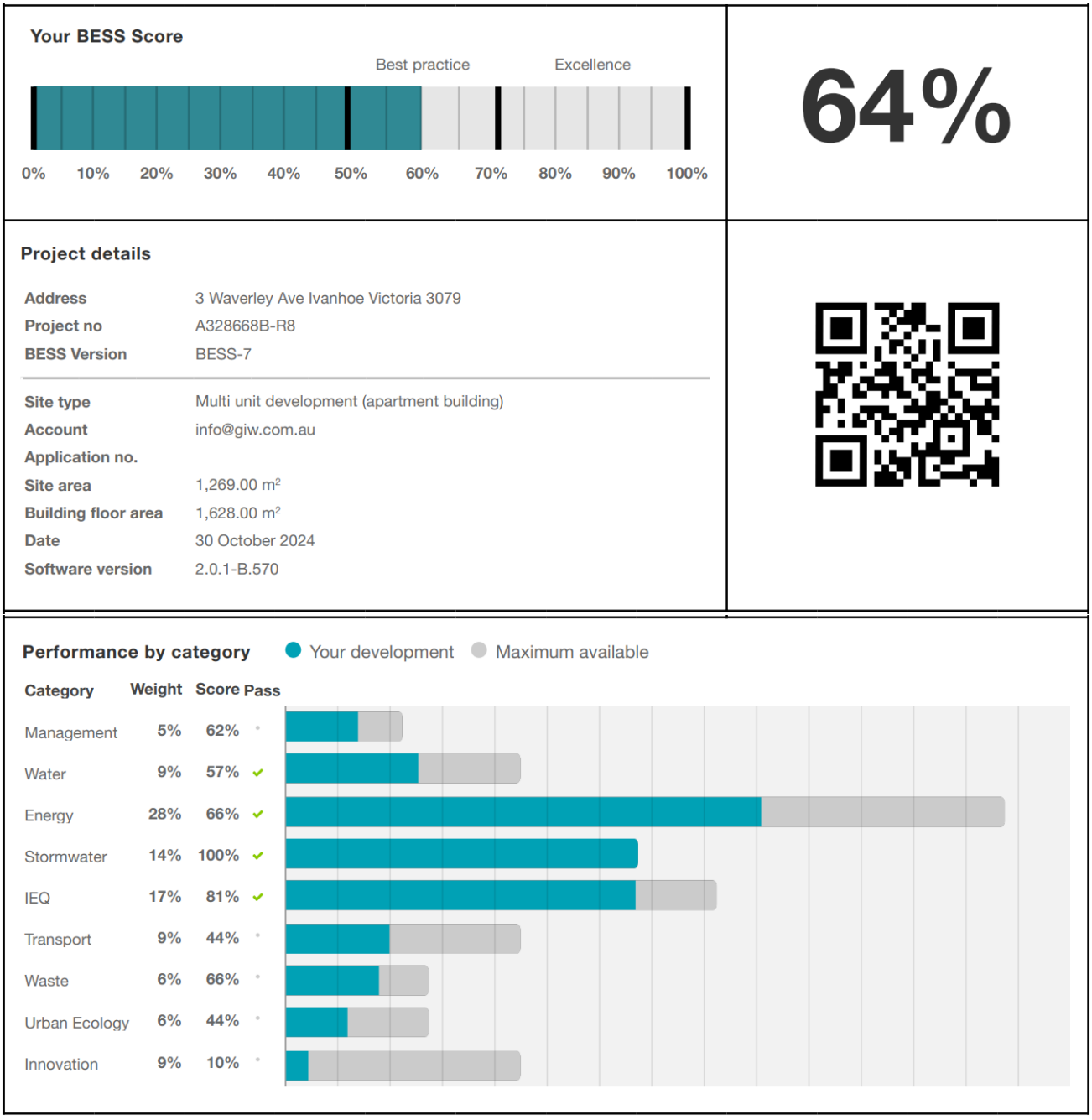
2. ESD Summary

The proposed multi-dwelling development at 3 Waverley Avenue, Ivanhoe will implement the following ESD initiatives:

1. The project achieves a total BESS score of 64% with no mandatory category (IEQ, Energy, Water, Stormwater) below 50%.
2. 80% (8 out of 10) of the development's apartments are naturally ventilated.
3. Daylight compliance is demonstrated using the BESS built-in daylight calculator.
4. 60% (6 out of 10) of apartments achieve at least 3 hours of sunlight.
5. The development is provided with a comprehensive shading strategy.
6. The development is to achieve a 7.0 Star average NatHERS Energy Rating result.
7. The development is to utilise an electric instantaneous hot water system.
8. A 15kW Solar PV system is to be located on the roof of the proposed development.
9. Individual cold and hot water, electricity meters will be provided to the apartments and communal areas.
10. Water efficient fittings and fixtures are applied throughout.
11. A 15,000-litre rainwater tank will harvest rainwater from the roof areas. This tank will be connected to al WCs and landscape irrigation.
12. A Melbourne STORM rating of 106% is achieved.
13. Landscape irrigation demand will be connected to the rainwater tank.
14. In total 2 bicycle spaces are to be provided for residential visitors.
15. In total 9 bicycle spaces are to be provided for residents.
16. 1 x EV charging station will be provided to G.01, the remaining 9 apartments will have pre-wiring for their own future EV stations.
17. The proposed development will incorporate a green wall to the core external wall.
18. The development will be all-electric with no gas connection to site.

3. BESS Performance

The project achieves 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.



4. ESD Assessment

Management

Council ESD objectives:

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

Council Best Practice Standard

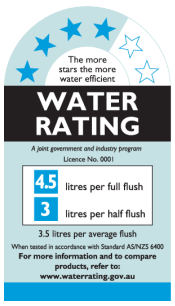
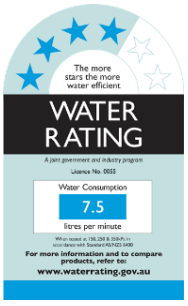
Criteria		Construction and Building Management Actions
Pre-Application Meeting	To ensure appropriate sustainable design principles and strategies are considered from the preliminary design stage of each development.	GIW has been actively involved in the preliminary design stage, but has not been involved in a pre-application meeting with Council.
Metering	To provide building users with information that allows monitoring of energy and water consumption	Electricity, cold water and hot water metering is to be provided to each individual apartment. Lighting and general power to common areas is to be separately metered to quantify energy used for common areas spaces. Smart metering for electricity and water will be provided to all apartments and interface will be provided for the EV charging units.
Building User's Guide	To encourage and recognise initiatives that will help building users to use the building more efficiently.	A Building User's Guide will be provided to all occupants explaining the correct use of installed equipment and building systems. This shall cover at a minimum: • Energy and Environmental Strategy • Options for purchasing a ≥3 Star Washing Machine • Monitoring and Targeting • Building Services • Transport Facilities • Materials and Waste Policy • Expansion/Re-fit Considerations • References and Further Information The building user guide is to be developed by the contractor prior to practical completion.

Water

Council ESD objectives:

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

Council Best Practice Standard

Criteria		Development Provision
Potable Water Reduction	To reduce total potable water use due through the use of efficient fixtures, appliances, and the use of rainwater.	WELS 4 Star - Toilets  WELS 5 Star - Taps  WELS 4 Star -Showerhead  WELS 5 Star - Dishwasher 
Rainwater Collection & Reuse		A 15,000-litre rainwater tank will harvest rainwater from the roof areas. This tank will be connected to al WCs and landscape irrigation. It is estimated that this will save more than 188kL of potable water every year and meet 42% of the demand in these areas. Stormwater drainage mechanism is to be determined by the hydraulics services engineer at the design development phase. Refer Appendix A – WSUD Response
Landscape Irrigation	To ensure the efficient use of water and to reduce total operating potable water use through encouraging water efficient landscape design.	Landscape irrigation demand will be connected to the rainwater tank.
Building	Ensure the	>80% of fire test water (e.g. hydrant pump test water or SCV

Council Best Practice Standard

Criteria		Development Provision
System Water Use Reduction	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.	annubar test) is to be reused on site. The proposed development is to incorporate air-cooled HVAC systems for the residential areas within the development.

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.	The National Construction Code (NCC) Class 2 – Sole Occupancy Unit(s) residential building component is to be designed in accordance with NCC Section J (2019) NatHERS requirements. The residential units must achieve an average 7.0 Star rating, with no unit achieving below 5.0 Stars. Further to this no dwelling is to exceed the maximum allowed cooling load of 21 MJ/m2 (Climate Zone 62 Moorabbin) In accordance with BADS Standard B35. The apartments are currently achieving a 7.5 Star average. This represents > 10% reduction compared to minimum NCC compliance benchmarks. The below sample ratings demonstrate the developments' ability to achieve this average. Refer Appendix B for Preliminary FirstRate5 Certificates.

Apartment No.	ACE Total MJ/M2	ACE Heating	ACE Cooling	ACE NCFA	Star Rating
G.01	53	45.5	7.5	181.3	8.2
G.02	62.8	46.2	16.6	138.4	7.9
G.03	82.5	73.9	8.6	141.4	7.3
G.04	111.9	106.4	5.5	125.3	6.4
L1.01	66.1	59.9	6.2	124.3	7.8
L1.02	54.6	39.9	14.7	128.8	8.1
L1.03	75	57.9	17.1	126.5	7.5
L1.04	70.4	61.6	8.8	127.4	7.6
L2.01	73.4	55.6	17.8	162.2	7.5
L2.02	92.1	73.7	18.4	151	6.9
Average	**74.2**	**62.1**	**12.1**	**140.7**	**7.5**

*Apartments are assessed using FirstRate5 v5.3.2a

Council Best Practice Standard

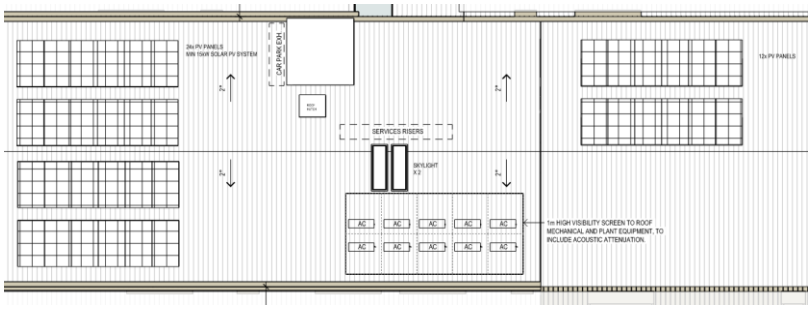
<table>
<tr><th>Criteria</th><th></th><th>Development Provision</th></tr>
<tr><td></td><td></td><td>Construction assumptions for preliminary FirstRate5 ratings are listed below. Note, these assumptions are based on the sample of apartments assessed and may vary throughout the development. These assumptions are not to be relied upon for any other purpose beyond Town Planning assessment.

<table>
<tr><th>Element</th><th>Material</th><th>Insulation Value</th></tr>
<tr><td>Floor</td><td>Concrete</td><td>R2.30</td></tr>
<tr><td rowspan="3">External Walls</td><td>Concrete</td><td>R1.8</td></tr>
<tr><td>Brick</td><td>R2.5</td></tr>
<tr><td>Steel Clad</td><td>R2.5</td></tr>
<tr><td rowspan="2">Internal Walls</td><td>Plasterboard</td><td>R2.5</td></tr>
<tr><td>Concrete</td><td>R1.8</td></tr>
<tr><td>Where exposed above</td><td>Concrete</td><td>R2.30</td></tr>
<tr><td>Roof (SRI 0.6)</td><td>Metal Deck Roof</td><td>R1.3+R5.0 with 2 reflective linings</td></tr>
<tr><td>Awning Window</td><td>Aluminium framed, Double glazed, Argon filled, Low-E, Clear</td><td>Total System
U-Value: 4.42
SHGC: 0.40</td></tr>
<tr><td>Fixed Windows</td><td>Aluminium framed, Double glazed, Argon filled, Low-E, Clear</td><td>Total System
U-Value: 2.71
SHGC: 0.58</td></tr>
<tr><td>Sliding Door</td><td>Aluminium framed, Double glazed, Argon filled, Low-E, Clear</td><td>Total System
U-Value: 3.19
SHGC: 0.48</td></tr>
<tr><td>Skylight</td><td>Aluminium framed, Double glazed, Argon filled, Low-E, Clear</td><td>Total System
U-Value: 2.58
SHGC: 0.24</td></tr>
</table>
</td></tr>
<tr><td>All- Electric</td><td>Reduction of greenhouse gas emissions.</td><td>The development will be all-electric with no gas connection to the site.</td></tr>
</table>

Council Best Practice Standard

Criteria		Development Provision
HVAC System	To ensure the efficient use of energy and to reduce consumption of electricity.	Inverter split systems are to be installed and sized to maintain conditions of the habitable rooms of each apartment. The efficiency of the air conditioning system is to be within 1 star rating of best available under MEPS Post-October 2012 measurement standard. Alternatively, systems are to have a COP or EER not less than 85% of the most efficient equivalent capacity unit available.
Hot Water System	To ensure the efficient use of energy and to reduce consumption and greenhouse emissions from water heating.	The development is to utilise an electric instantaneous hot water system.
Car Park Ventilation	To ensure the efficient use of energy, reduce total operating greenhouse gas emissions and to reduce energy peak demand.	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. The mechanical services engineer is responsible for the design and specification of the system. The contractor is to procure and install the specified system. Maintenance requirements of the CO sensor system are to be included in the O&M manual.
Clothes Drying	Ensure the efficient use of energy and to reduce energy consumption and greenhouse emissions associated with clothes drying	All ground floor apartments will be provided with retractable clothes drying lines within the POS.
Internal Lighting - Residential	To ensure the efficient use of energy, to reduce energy	The maximum illumination power density (W/sqm) is at least 20% lower than NCC 2019 requirements. Lighting power density shall be as follows:

Council Best Practice Standard

Criteria		Development Provision
	consumption, greenhouse emissions associated with artificial lighting, and to reduce energy peak demand.	• Dwellings: No greater than average 4W/m^2 • POS: No greater than average 4W/m^2 • Back of house and indoor car parks: No greater than average 5W/m^2 All common area, external and carpark lighting is to be controlled with daylight, motion sensors or timers (whichever is deemed appropriate).
Renewable Energy Systems - Solar	To encourage on-site renewable energy generation and reduce greenhouse emissions.	A 15kW Solar PV system is to be located on the roof of the proposed development. The system is expected to generate approximately 21,624kWh and will provide 84% of common area lighting and power.  Location Solar PV System Refer Appendix C – Renewable Energy

Stormwater

Council ESD objectives:

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

Council Best Practice Standard

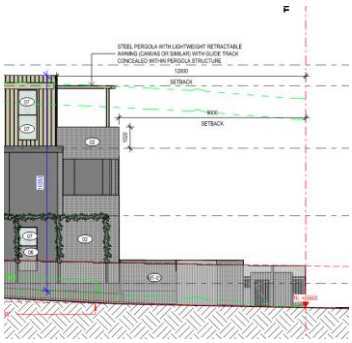
Criteria		Development Provision
Stormwater Treatment	To minimise negative environmental impacts of stormwater runoff and maximise onsite re-use of stormwater.	The Melbourne Water - Stormwater Treatment Objective Relative Measure (STORM) tool has been applied to determine performance relative to Best Practice Environmental Management Guidelines (Victoria Stormwater Committee, 1999). As per City of Banyule Planning Scheme Clause 53.18 Stormwater Management in Urban Development, the development is required to achieve a STORM rating of 100% or greater. A Melbourne STORM rating of 106% is achieved via the following: • Rainwater is to be collected from the upper and lower roof areas and is to be directed into the 15,000-litre rainwater tank. All WCs and landscape irrigation are to be connected to the rainwater tank. Refer Appendix A – WSUD Response.

Indoor Environment Quality

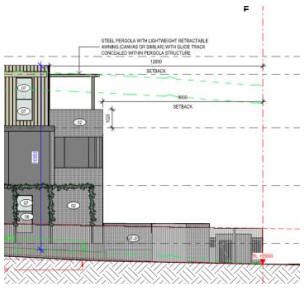
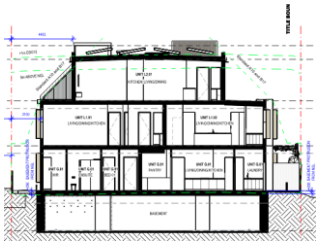
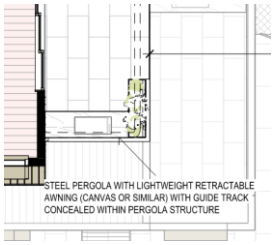
Council ESD objectives:

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

Council Best Practice Standard

Criteria		Development Provision
Daylight Access - Residential	To provide a high level of amenity and energy efficiency through design for natural light.	Daylight compliance is demonstrated using the BESS built-in daylight calculator. Refer Appendix E – BESS Assessment.
Winter Sunlight	To provide a high level of amenity and reduce need for artificial heating in winter.	60% (6 out of 10) of apartments achieve at least 3 hours of sunlight.
Minimal Internal Bedrooms	90% of bedrooms have an external window.	NIL internal bedrooms.
Cross Flow Ventilation	To provide fresh air and passive cooling opportunities.	80% (8 out of 10) of the development's apartments are naturally ventilated. Apartments are provided with windows on opposite or adjacent facades or are effective single sided ventilated. Refer Appendix D - Breeze Pathways.
Thermal Comfort	To provide comfortable indoor spaces and reduce energy needed for heating and cooling.	The development is provided with a comprehensive shading strategy:  North oriented windows at ground floor are shaded by  North oriented windows at level 1 are shaded by the

Council Best Practice Standard

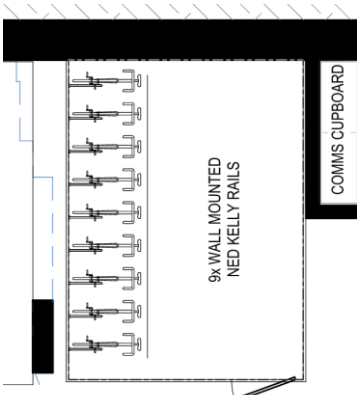
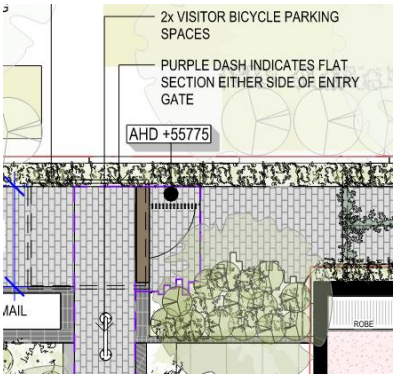
Criteria		Development Provision
		external venetian blinds  North oriented windows at level 2 are shaded by a steel pergola with retractable awnings.  East and west oriented windows at ground – Level 2 are shaded by 300mm deep window boxes.
		overhanging slab of the floor above.  East and west oriented windows at ground floor are shaded by the boundary fence and the adjacent developments.  South facing living room window within apartment L2.02 will have a retractable awning on the arbour system.
Air Quality – Non-Residential	All paints and adhesives meet the maximum total indoor pollutant emission limits.	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.
	All carpet meets the maximum total indoor pollutant emission limits.	All internally applied carpets are to have a low VOC content in line with Green Star Buildings V1 Credit 13.
	All engineered wood meets the maximum total indoor pollutant emission limits.	All internally applied engineered wood products are to have low formaldehyde levels in line with Green Star Buildings V1 Credit 13.

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	
Bicycle Parking – Residential & Residential Visitors	To encourage and recognise initiatives that facilitate cycling.	 In total 9 bicycle spaces are to be provided for residents.	 In total 2 bicycle spaces are to be provided for residential visitors. This will provide a ratio of approximately 1 visitor bicycle space for every 5 apartments.
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.	1 x EV charging station will be provided to G.01, the remaining 9 apartments will have pre-wiring for their own future EV stations. EV charging will support Level 2 (mode 3) 7kW 32Amp. All pre-wiring cabling and GPO's for EV chargers will support level 2 (mode 3) 7Kw 32Amp EV charging. 1 X EV CHARGING STATION WILL BE PROVIDED TO G.01, THE REMAINING 9 APARTMENTS WILL HAVE PRE-WIRING FOR THEIR OWN FUTURE EV STATIONS. CO SENSORS CONNECTED TO THE EXHAUST FANS ARE TO BE PROVIDED Location of electric charging points. Smart metering and interface will be provided for the EV charging units.	

Council Best Practice Standard

Criteria		Development Provision
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.	NIL.
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.	NIL.

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)	The design will seek to limit the use of high embodied energy metal finishes. 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).
Concrete	Reduction of the impact of using concrete.	Concrete elements will have a 30% Portland Cement reduction where approved by the structural engineer.
Structural and Reinforcing Steel	Commitment to source structural and reinforcing steel from a responsible steel maker	The building's steel (by mass) is to be sourced from a Responsible Steel Maker with: • 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	Permanent formwork, pipes, flooring, blinds, and cables in the project will seek to comply with the following: • Meet the GBCA's Best Practice Guidelines for PVC. or; • The supplier holds a valid ISO140001 certification.

Council Best Practice Standard

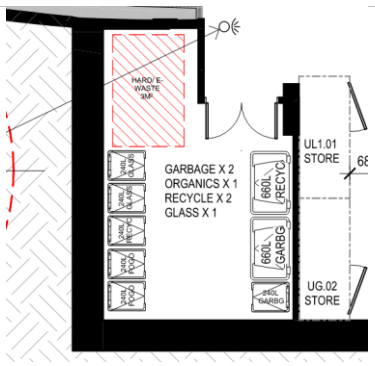
Criteria		Development Provision
Sustainable Products	Commitment to source products that meet the transparency and sustainability requirements	The project will incorporate products that meet the transparency and sustainability requirements where deemed appropriate. This includes the following: reused 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	To ensure waste avoidance, reuse, and recycling during the design.	None of the existing structure is re-used.
Construction and Demolition Waste	To reduce construction waste going to landfill	At least 80% of the waste generated during construction and demolition has been diverted from landfill.
Food & Garden Waste	To ensure waste avoidance, reuse, and recycling during the operational life of the building.	Green waste storage is provided in the basement bin room.
Convenience of Recycling	To ensure waste avoidance, reuse, and recycling during the operational life of the building.	 Separate general, recycling, glass and organic waste storage will be provided at the basement bin room. Kitchen joinery is to provide appropriate spatial allowance for food and organics, general and recycling waste collection.

Urban Ecology

Council ESD objectives:

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

Council Best Practice Standard

Criteria		Development Provision
Communal Space	To encourage and recognise initiatives that facilitate interaction between building occupants.	NIL.
Vegetation	To encourage and recognise the use of vegetation and landscaping within and around developments.	Planter boxes and landscaped areas are to be located at ground level. The total area of vegetation is 21% of the site area.
Green Walls / Roof	To encourage the appropriate use of green roofs, walls, and facades to mitigate the impact of the urban heat island effect.	NIL
Private Open Space - Balcony / Courtyard Ecology	To encourage plants in a healthy ecological context to be grown on balconies and in courtyards.	All balconies or private open space have been provided with a tap and floor waste allowing residents to cultivate their own gardens.

Council Best Practice Standard

Criteria		Development Provision
Food Production - Residential	To encourage the production of fresh food on-site.	NIL.
Heat Island Effect	To reduce the contribution of the project site to the 'heat island effect	Roofs are to have a three-year SRI of minimum 60. Unshaded hard-scaping elements are to have a three-year SRI of minimum 40.

Appendices

Appendix A: WSUD Response

Site layout Plan

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

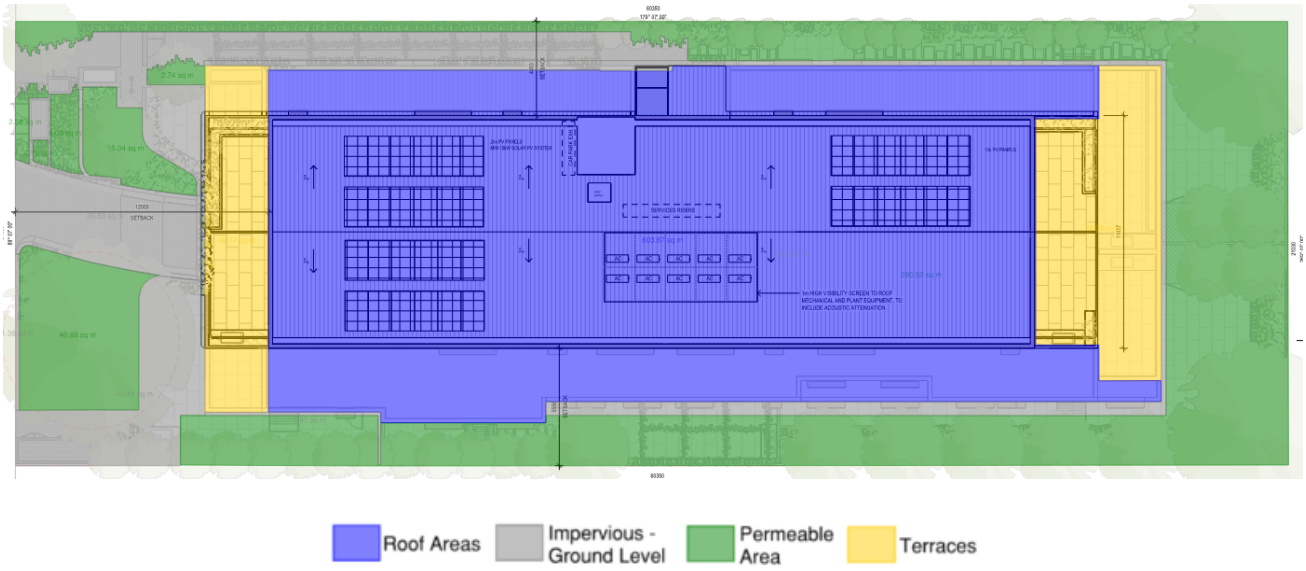


Figure 1 - Mark-up of water catchment and impervious areas

STORM Rating Report

A STORM rating of ≥100% can be achieved by implementing the following initiatives:

- Rainwater collection off the upper and lower roofs is to be directed into a 15,000-litre rainwater tank connected to all WC's and landscape irrigation.

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

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

The STORM Result is provided below:

Melbourne Water **STORM Rating Report**

TransactionID:	0
Municipality:	BANYULE
Rainfall Station:	BANYULE
Address:	3 Waverley Avenue
	Ivanhoe
	VIC 3079
Assessor:	GIW
Development Type:	Residential - Multiunit
Allotment Site (m2):	1,269.00
STORM Rating %:	106

Description	Impervious Area (m2)	Treatment Type	Treatment Area/Volume (m2 or L)	Occupants / Number Of Bedrooms	Treatment %	Tank Water Supply Reliability (%)
Upper and Lower Roof	604.00	Rainwater Tank	15,000.00	30	160.20	82.00
Terraces	125.00	None	0.00	0	0.00	0.00
Impervious - GF	180.00	None	0.00	0	0.00	0.00

WSUD Strategy

The development will include the provision of a 15,000-litre rainwater tank and associated pump in the basement garage. The rainwater tank is to be connected to all WC's and landscape irrigation.

Figure 2 – Location Rainwater Tank

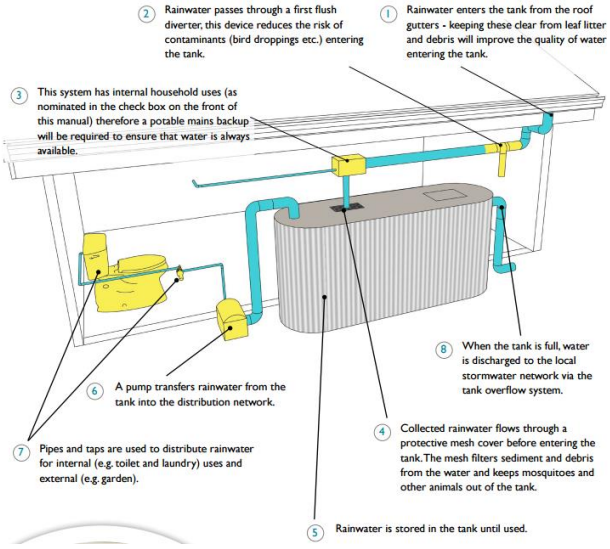


Figure 3 – Cross-section Tank
(City of Port Phillip)

Rainwater Reuse

Inputs

Catchment Area	604 sqm
Number of Bedrooms	30
Bin Washout	No
Irrigation Area	268 sqm
Tank Capacity	15,000 Litre

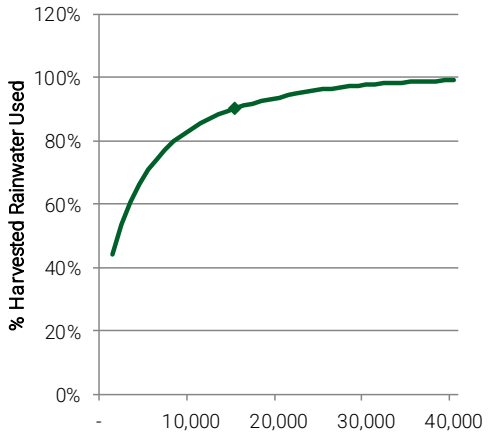
Outputs

% Served by Rainwater	41.8%
% Harvested Rainwater Used	90.3%
Total Potable Water Saved	188,174 Litre

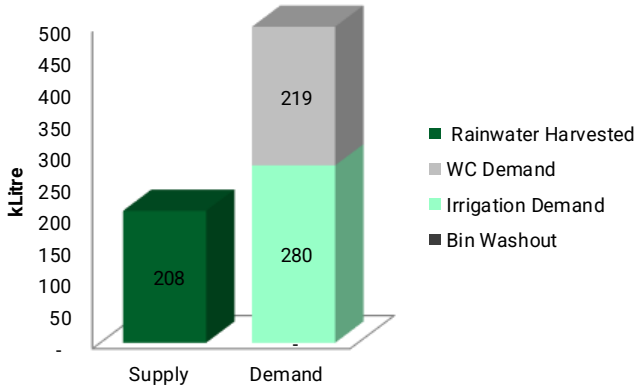
Rainwater Balance (Monthly Averages)

Month	Rainwater Harvested (L)	Irrigation Demand (L)	WC Demand (L)	Bin Washout (L)
Jan	13,737	41,464	18,600	0
Feb	17,187	37,562	16,800	0
Mar	15,382	19,268	18,600	0
Apr	17,450	18,445	18,000	0
May	16,571	19,033	18,600	0
Jun	17,232	8,673	18,000	0
Jul	13,307	8,837	18,600	0
Aug	17,037	8,837	18,600	0
Sep	18,102	25,352	18,000	0
Oct	18,764	25,830	18,600	0
Nov	25,151	25,193	18,000	0
Dec	18,577	41,785	18,600	0
Total	208,497	280,279	219,000	0
Equivalent STORM tool		38		0

Tank Sizing



Supply-Demand



Site Management Statement

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

- Buffer strips to pervert 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

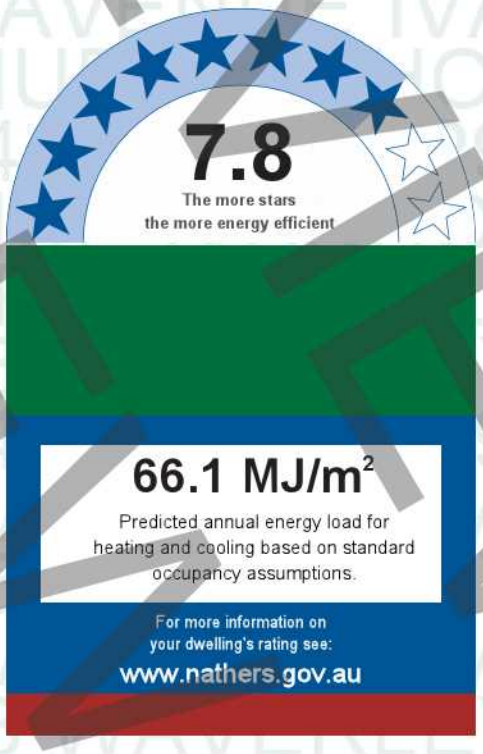
The following maintenance requirements are to be programmed to ensure the rainwater tank operates effectively:

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 FirstRate5 Certificates

Nationwide House Energy Rating Scheme
NatHERS Certificate

Generated on 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	1.01, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	124.3
Unconditioned*	0
Total	124.3
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
59.9 MJ/m²	6.2 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.

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.

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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living 39	CAP-061-06 A	Opening 84	2000	880	awning	40.0	E	No

* Refer to glossary.

Kitchen/Living 39	CAP-057-13 A	Opening 73	2700	1800	sliding	45.0	N	No
Kitchen/Living 39	CAP-057-13 A	Opening 74	2700	4960	sliding	45.0	N	No
Bedroom 3	CAP-061-06 A	Opening 76	2000	1780	awning	40.0	E	No
Bedroom 2	CAP-061-06 A	Opening 78	2000	1780	awning	40.0	E	No
Bedroom 1	CAP-061-06 A	Opening 80	2000	1780	awning	40.0	E	No

Roof window *type and performance value*

Default* roof windows

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

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	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 (m²)	Orient-ation	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	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	Waverley Avenue - Brick Wall	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
3	Waverley Avenue - Internal Plasterboard Stud Wall	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

* Refer to glossary.

4	Waverley Avenue - Int Cncrete Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living 39	1	2980	4517	E	0	Yes
Kitchen/Living 39	2	2980	8618	N	2809	Yes
Kitchen/Living 39	3	2980	4475	W	0	No
Pantry	3	2980	1439	W	0	No
Bedroom 3	1	2980	2999	E	0	Yes
Bedroom 2	1	2980	3011	E	0	Yes
Bedroom 1	4	2980	2450	S	0	No
Bedroom 1	1	2980	3459	E	0	Yes
WIR	4	2980	2747	W	0	No
WIR	1	2980	2236	S	0	Yes
WIR	1	2980	2716	E	0	Yes
Laundry	3	2980	2498	W	0	No
Laundry	3	2980	1585	S	0	No
PDR	3	2980	1697	W	0	No
Hallway	4	2980	637	E	0	No
Hallway	3	2980	1166	W	0	No
Hallway	3	2980	2094	S	0	No
Bath	3	2980	2881	W	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	150.9	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living 39	FR5 - 300mm concrete slab	9.3	Enclosed	R0.0	Timber
Kitchen/Living 39	FR5 - 300mm concrete slab	29.2	Enclosed	R0.0	Timber
Pantry	FR5 - 300mm concrete slab	2.5	Enclosed	R0.0	Timber
Bedroom 3	FR5 - 300mm concrete slab	5.4	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 300mm concrete slab	6.2	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm concrete slab	7.9	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm concrete slab	6.2	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 300mm concrete slab	6.7	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 300mm concrete slab	7.2	Enclosed	R0.0	Carpet
Ensuite	FR5 - 300mm concrete slab	6.6	Enclosed	R0.0	Carpet

* Refer to glossary.

WIR	FR5 - 300mm concrete slab	0.5	Elevated	R2.3	Tiles
WIR	FR5 - 300mm concrete slab	5.4	Elevated	R2.3	Tiles
WIR	FR5 - 300mm concrete slab	0.2	Enclosed	R0.0	Tiles
WIR	FR5 - 300mm concrete slab	0	Enclosed	R0.0	Tiles
Laundry	FR5 - 300mm concrete slab	3.9	Enclosed	R0.0	Tiles
PDR	FR5 - 300mm concrete slab	2.6	Enclosed	R0.0	Tiles
Hallway	FR5 - 300mm concrete slab	20.4	Enclosed	R0.0	Timber
Bath	FR5 - 300mm concrete slab	4.4	Enclosed	R0.0	Tiles

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Kitchen/Living 39	Plasterboard	R6.3	No
Bedroom 3	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
Bedroom 1	Plasterboard	R6.3	No
WIR	Plasterboard	R6.3	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living 39	16	Downlights	80	Sealed
Kitchen/Living 39	1	Exhaust Fans	250	Sealed
Pantry	1	Downlights	80	Sealed
Bedroom 3	5	Downlights	80	Sealed
Bedroom 2	6	Downlights	80	Sealed
Bedroom 1	6	Downlights	80	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
WIR	2	Downlights	80	Sealed
Laundry	2	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
PDR	1	Downlights	80	Sealed
PDR	1	Exhaust Fans	250	Sealed
Hallway	8	Downlights	80	Sealed
Bath	1	Exhaust Fans	250	Sealed
Bath	2	Downlights	80	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	0.4	Medium
Slab:Slab - Suspended Slab : 300mm: 300mm Suspended Slab	0.0	0.5	Medium

Explanatory Notes

About this report

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

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

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

Accredited assessors

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

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

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 NatHERSAdministrator. 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.

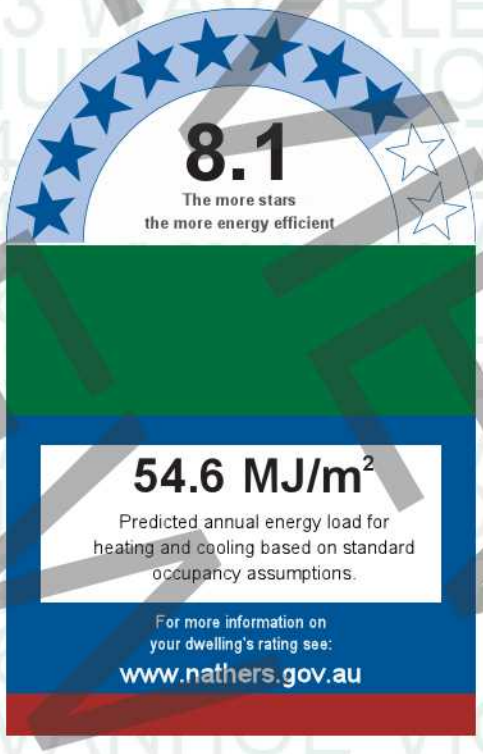
Glossary

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.

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 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	1.02, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	128.8
Unconditioned*	3
Total	131.8
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
39.9 MJ/m²	14.7 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.

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.

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.

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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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
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-061-06 A	Opening 76	2100	1780	awning	40.0	W	No

* Refer to glossary.

Generated on 11 Oct 2024 using FirstRate5: 5.3.2b (3.21) for 1.02, 3 Waverley Avenue, Ivanhoe , VIC,

Bedroom 2	CAP-061-06 A	Opening 79	2100	1780	awning	40.0	W	No
WIR	CAP-061-06 A	Opening 85	2100	880	awning	40.0	W	No
Bedroom 1	CAP-061-06 A	Opening 81	2100	1780	awning	40.0	W	No
Kitchen/Living 58	CAP-061-06 A	Opening 84	2100	880	awning	40.0	W	No
Kitchen/Living 58	CAP-057-13 A	Opening 74	2700	4960	sliding	45.0	N	No

Roof window *type and performance value*

Default* roof windows

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

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	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 (m²)	Orient-ation	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	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	Waverley Avenue - Internal Plasterboard Stud Wall	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
3	Waverley Avenue - Brick Wall	0.7	Dark	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)
Pantry	1	2980	642	W	0	Yes
Pantry	1	2980	503	N	0	Yes
Pantry	1	2980	1159	W	0	Yes
Bedroom 3	1	2980	2982	W	0	Yes
Bedroom 2	1	2980	3007	W	0	Yes
Bedroom 2	1	2980	1070	S	0	Yes
WIR	1	2980	2127	W	0	Yes
Bedroom 1	1	2980	3473	W	0	Yes
Bedroom 1	2	2980	3631	S	0	No
Kitchen/Living 58	1	2980	4860	W	0	Yes
Kitchen/Living 58	2	2980	6845	E	0	No
Kitchen/Living 58	3	2980	7021	N	2699	Yes
Hallway	2	2980	334	S	0	No
Hallway	2	2980	1773	E	0	No
Hallway	2	2980	1566	N	0	No
Hallway	2	2980	8314	E	0	No
Ensuite	2	2980	4010	S	0	No
Ensuite	2	2980	1805	E	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	145.3	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Pantry	FR5 - 300mm concrete slab	2.8	Enclosed	R0.0	Timber
Bedroom 3	FR5 - 300mm concrete slab	10	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 300mm concrete slab	4	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm concrete slab	10	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm concrete slab	4.4	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm concrete slab	4.8	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm concrete slab	2.7	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 300mm concrete slab	6.9	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 300mm concrete slab	8	Enclosed	R0.0	Carpet
PDR	FR5 - 300mm concrete slab	1.6	Enclosed	R0.0	Tiles
Bath	FR5 - 300mm concrete slab	4.5	Enclosed	R0.0	Tiles
Laundry	FR5 - 300mm concrete slab	3	Enclosed	R0.0	Tiles

* Refer to glossary.

Kitchen/Living 58	FR5 - 300mm concrete slab	28.6	Enclosed	R0.0	Timber
Kitchen/Living 58	FR5 - 300mm concrete slab	16.3	Enclosed	R0.0	Timber
Hallway	FR5 - 300mm concrete slab	16.9	Enclosed	R0.0	Timber
Ensuite	FR5 - 300mm concrete slab	7.2	Enclosed	R0.0	Tiles

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Pantry	Plasterboard	R6.3	No
Bedroom 3	Plasterboard	R6.3	No
Bedroom 2	Plasterboard	R6.3	No
WIR	Plasterboard	R6.3	No
Bedroom 1	Plasterboard	R6.3	No
Kitchen/Living 58	Plasterboard	R6.3	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Pantry	1	Downlights	80	Sealed
Bedroom 3	6	Downlights	80	Sealed
Bedroom 2	6	Downlights	80	Sealed
WIR	3	Downlights	80	Sealed
Bedroom 1	6	Downlights	80	Sealed
PDR	1	Exhaust Fans	250	Sealed
Bath	2	Downlights	80	Sealed
Bath	1	Exhaust Fans	250	Sealed
Laundry	1	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
Kitchen/Living 58	17	Downlights	80	Sealed
Kitchen/Living 58	1	Exhaust Fans	250	Sealed
Hallway	7	Downlights	80	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	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
Slab:Slab - Suspended Slab : 300mm: 300mm Suspended Slab	0.0	0.5	Medium

* Refer to glossary.

Explanatory Notes

About this report

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

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

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

Accredited assessors

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

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

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 NatHERSAdministrator. 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.

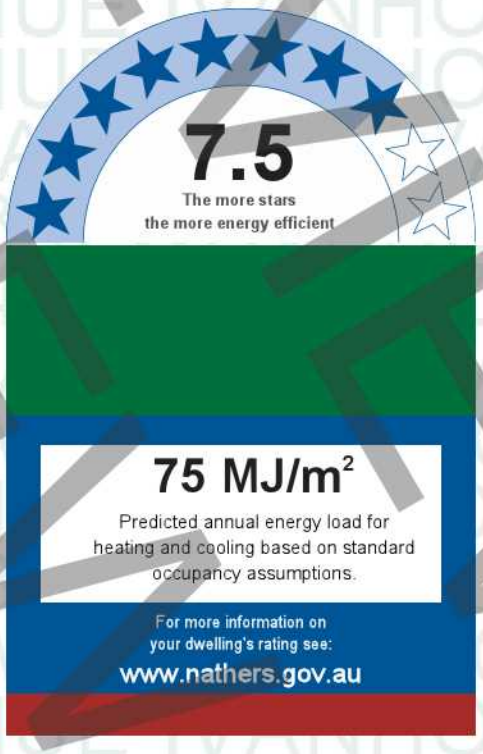
Glossary

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.

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 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	1.03, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	-
Prepared by	-

Construction and environment

Assessed floor area (m²)*	
Conditioned*	126.5
Unconditioned*	1.4
Total	127.9
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
57.9 MJ/m²	17.1 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

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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.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
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 62	CAP-061-06 A	Opening 73	2700	1764	awning	30.0	W	No
Bedroom 64	CAP-061-06 A	Opening 75	2700	1821	awning	30.0	W	No
Bedroom 65	CAP-061-06 A	Opening 79	2700	1827	awning	30.0	W	No

* Refer to glossary.

Generated on 11 Oct 2024 using FirstRate5: 5.3.2b (3.21) for 1.03, 3 Waverley Avenue, Ivanhoe , VIC,

Kitchen/Living 70	CAP-061-06 A	Opening 81	2700	957	awning	30.0	W	No
Kitchen/Living 70	CAP-057-13 A	Opening 82	2800	4956	sliding	45.0	S	No
WIR	CAP-061-06 A	Opening 83	2100	892	awning	30.0	W	No

Roof window *type and performance value*

Default* roof windows

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

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	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 (m²)	Orient-ation	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	Waverley Avenue - Internal Plasterboard Stud Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
2	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

External wall *schedule*

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

WIR	1	3000	3859	N	0	No
WIR	1	3000	1788	E	0	No
Bedroom 62	1	3000	3787	N	0	No
Bedroom 62	2	3000	234	W	0	Yes
Bedroom 62	2	3000	1784	W	0	Yes
Bedroom 62	2	3000	1467	W	0	Yes
Bedroom 64	2	3000	339	W	0	Yes
Bedroom 64	2	3000	1844	W	0	Yes
Bedroom 64	2	3000	772	W	0	Yes
Bedroom 65	2	3000	760	W	0	Yes
Bedroom 65	2	3000	1861	W	0	Yes
Bedroom 65	2	3000	434	W	0	Yes
Hallway	1	3000	6207	E	0	No
Hallway	1	3000	1352	S	0	No
Hallway	1	3000	2122	E	0	No
Hallway	1	3000	298	N	0	No
Pantry	2	3000	985	N	0	Yes
Pantry	2	3000	1756	W	0	No
Kitchen/Living 70	2	3000	1233	W	0	Yes
Kitchen/Living 70	2	3000	984	W	0	Yes
Kitchen/Living 70	2	3000	3636	W	0	Yes
Kitchen/Living 70	2	3000	992	S	0	Yes
Kitchen/Living 70	2	3000	5787	S	0	Yes
Kitchen/Living 70	1	3000	9718	E	0	No
WIR	2	3000	677	W	0	Yes
WIR	2	3000	926	W	0	Yes
WIR	2	3000	685	W	0	Yes
WIR	2	3000	980	S	0	Yes

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	128.3	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
WIR	FR5 - 300mm concrete slab	6.8	Enclosed	R0.0	Carpet
Bedroom 62	FR5 - 300mm concrete slab	7.9	Enclosed	R0.0	Carpet
Bedroom 62	FR5 - 300mm concrete slab	1.3	Enclosed	R0.0	Carpet
Bedroom 62	FR5 - 300mm concrete slab	5.8	Enclosed	R0.0	Carpet
Ensuite	FR5 - 300mm concrete slab	4.3	Enclosed	R0.0	Tiles
Bedroom 64	FR5 - 300mm concrete slab	2	Enclosed	R0.0	Carpet

Bedroom 64	FR5 - 300mm concrete slab	2.9	Enclosed	R0.0	Carpet
Bedroom 64	FR5 - 300mm concrete slab	5.6	Enclosed	R0.0	Carpet
Bedroom 65	FR5 - 300mm concrete slab	2.1	Enclosed	R0.0	Carpet
Bedroom 65	FR5 - 300mm concrete slab	3	Enclosed	R0.0	Carpet
Bedroom 65	FR5 - 300mm concrete slab	5.8	Enclosed	R0.0	Carpet
Hallway	FR5 - 300mm concrete slab	16.5	Enclosed	R0.0	Timber
Pantry	FR5 - 300mm concrete slab	2.9	Enclosed	R0.0	Timber
Pantry	FR5 - 300mm concrete slab	0.2	Enclosed	R0.0	Timber
Kitchen/Living 70	FR5 - 300mm concrete slab	4.9	Enclosed	R0.0	Timber
Kitchen/Living 70	FR5 - 300mm concrete slab	5	Enclosed	R0.0	Timber
Kitchen/Living 70	FR5 - 300mm concrete slab	4.3	Enclosed	R0.0	Timber
Kitchen/Living 70	FR5 - 300mm concrete slab	14.7	Enclosed	R0.0	Timber
Kitchen/Living 70	FR5 - 300mm concrete slab	21.8	Enclosed	R0.0	Timber
Laundry	FR5 - 300mm concrete slab	1.4	Enclosed	R0.0	Tiles
WIR	FR5 - 300mm concrete slab	5.2	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm concrete slab	3.5	Enclosed	R0.0	Carpet

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 62	Plasterboard	R6.3	No
Bedroom 64	Plasterboard	R6.3	No
Bedroom 65	Plasterboard	R6.3	No
Pantry	Plasterboard	R6.3	No
Kitchen/Living 70	Plasterboard	R6.3	No
Kitchen/Living 70	Plasterboard	R6.3	No
Kitchen/Living 70	Plasterboard	R2.3	No
Laundry	Plasterboard	R0.0	No
WIR	Plasterboard	R6.3	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
WIR	2	Downlights	80	Sealed
WIR	1	Exhaust Fans	250	Sealed
Bedroom 62	6	Downlights	80	Sealed
Ensuite	2	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
Bedroom 64	5	Downlights	80	Sealed
Bedroom 65	7	Downlights	80	Sealed
Hallway	7	Downlights	80	Sealed
Pantry	1	Downlights	80	Sealed
Kitchen/Living 70	19	Downlights	80	Sealed

* Refer to glossary.

Kitchen/Living 70	1	Exhaust Fans	250	Sealed
Laundry	1	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
WIR	3	Downlights	80	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 300mm: 300mm Suspended Slab	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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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.
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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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Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
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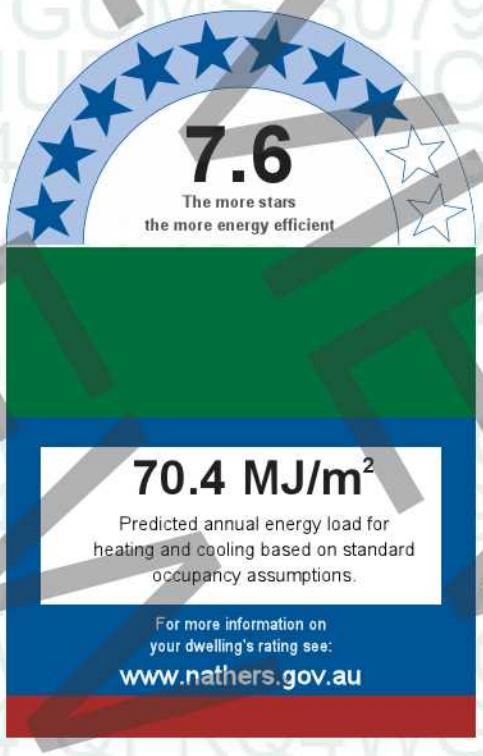
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well 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 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	1.04, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	127.4
Unconditioned*	3.9
Total	131.3
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
61.6 MJ/m²	8.8 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.

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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
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-061-06 A	Opening 23	2700	1768	awning	30.0	E	No

* Refer to glossary.

Bedroom 2	CAP-061-06 A	Opening 24	2700	1781	awning	30.0	E	No
Kitchen/Living	CAP-057-13 A	Opening 8	2500	1779	sliding	45.0	S	No
Kitchen/Living	CAP-057-13 A	Opening 27	2700	5184	sliding	45.0	S	No
Kitchen/Living	CAP-061-06 A	Opening 25	2700	923	awning	40.0	E	No
Bedroom 1	CAP-061-06 A	Opening 29	2700	1784	awning	30.0	E	No

Roof window *type and performance value*

Default* roof windows

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

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	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 (m²)	Orient-ation	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	Waverley Avenue - Int Cncrete Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
3	Waverley Avenue - Internal Plasterboard Stud Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

* Refer to glossary.

4	FR5 - Internal Plasterboard Stud Wall	0.3	Light	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 3	1	3000	505	N	0	No
Bedroom 3	1	3000	350	N	0	No
Bedroom 3	2	3000	1491	E	0	Yes
Bedroom 3	2	3000	1807	E	0	Yes
Bedroom 3	2	3000	270	E	0	Yes
Powder room	3	3000	1785	W	0	No
Laundry	3	3000	1587	N	0	No
Laundry	3	3000	2472	W	0	No
Bedroom 2	2	3000	626	E	0	Yes
Bedroom 2	2	3000	1825	E	0	Yes
Bedroom 2	2	3000	721	E	0	Yes
WC	3	3000	2964	W	0	No
Kitchen/Living	3	3000	5140	W	0	No
Kitchen/Living	2	3000	4258	S	0	Yes
Kitchen/Living	2	3000	4183	S	0	Yes
Kitchen/Living	2	3000	3954	E	0	Yes
Kitchen/Living	2	3000	963	E	0	Yes
Kitchen/Living	2	3000	253	E	0	Yes
Ensuite	1	3000	3747	N	0	No
Ensuite	1	3000	1429	W	0	No
Ensuite	1	3000	271	W	0	Yes
Ensuite	1	3000	1700	E	0	No
Bedroom 1	2	3000	396	E	0	Yes
Bedroom 1	2	3000	1799	E	0	Yes
Bedroom 1	2	3000	975	E	0	Yes
Pantry	3	3000	1567	W	0	No
Hallway	4	3000	360	E	0	Yes
Hallway	3	3000	2039	N	0	No
Hallway	3	3000	1237	W	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	159.5	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

* Refer to glossary.

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 3	FR5 - 300mm concrete slab	6.3	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 300mm concrete slab	0	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 300mm concrete slab	7.9	Enclosed	R0.0	Carpet
Powder room	FR5 - 300mm concrete slab	2.8	Enclosed	R0.0	Timber
Laundry	FR5 - 300mm concrete slab	3.9	Enclosed	R0.0	Tiles
WIR	FR5 - 300mm concrete slab	6.8	Enclosed	R0.0	Tiles
Bedroom 2	FR5 - 300mm concrete slab	6.4	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm concrete slab	0	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm concrete slab	7.1	Enclosed	R0.0	Carpet
WC	FR5 - 300mm concrete slab	4.7	Enclosed	R0.0	Tiles
Kitchen/Living	FR5 - 300mm concrete slab	17.1	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - 300mm concrete slab	11.3	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - 300mm concrete slab	0	Enclosed	R0.0	Timber
Kitchen/Living	FR5 - 300mm concrete slab	14.9	Enclosed	R0.0	Timber
Ensuite	FR5 - 300mm concrete slab	3.4	Enclosed	R0.0	Tiles
Ensuite	FR5 - 300mm concrete slab	2.9	Enclosed	R0.0	Tiles
Bedroom 1	FR5 - 300mm concrete slab	4.7	Enclosed	R0.0	Carpet
Bedroom 1	FR5 - 300mm concrete slab	7.1	Enclosed	R0.0	Carpet
Pantry	FR5 - 300mm concrete slab	2.8	Enclosed	R0.0	Tiles
Hallway	FR5 - 300mm concrete slab	21	Enclosed	R0.0	Timber

Ceiling *type*

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

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 3	5	Downlights	80	Sealed
Powder room	1	Downlights	80	Sealed
Powder room	1	Exhaust Fans	250	Sealed
Laundry	1	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
WIR	3	Downlights	80	Sealed
Bedroom 2	5	Downlights	80	Sealed
WC	2	Downlights	80	Sealed
WC	1	Exhaust Fans	250	Sealed

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Kitchen/Living	17	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	250	Sealed
Ensuite	2	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
Bedroom 1	5	Downlights	80	Sealed
Pantry	1	Downlights	80	Sealed
Hallway	8	Downlights	80	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

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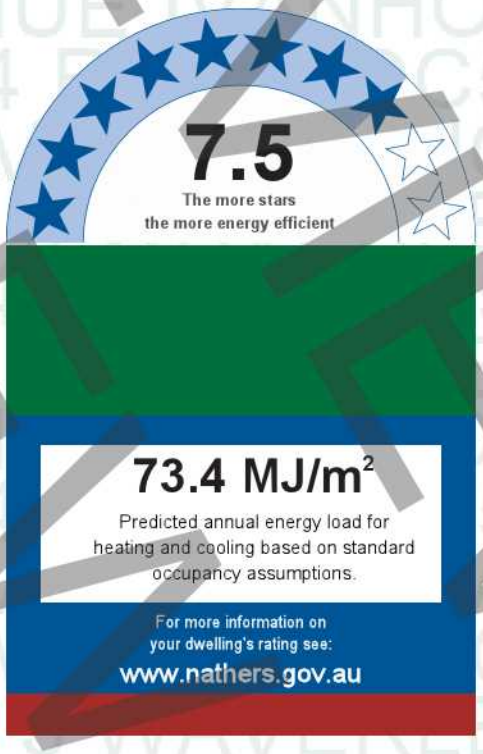
Nationwide House Energy Rating Scheme
NatHERS Certificate

Generated on 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	2.01, 3 Waverley Avenue, Ivanhoe , VIC, 3079
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NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	162.2
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Total	170
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
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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

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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.

Certificate Check

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Ceiling penetrations*

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

Windows

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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42

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 13	2700	3300	sliding	60.0	N	Yes

* Refer to glossary.

Kitchen/Living	CAP-057-13 A	Opening 22	2700	3300	sliding	60.0	N	Yes
Kitchen/Living	CAP-057-13 A	Opening 24	2700	1800	sliding	45.0	N	Yes
Kitchen/Living	CAP-061-06 A	Opening 14	2400	890	awning	45.0	E	No
Bedroom 3	CAP-061-06 A	Opening 16	2400	2665	awning	30.0	E	No
Laundry	CAP-061-06 A	Opening 17	2400	880	awning	45.0	E	No
Bedroom 2	CAP-061-06 A	Opening 19	2400	2665	awning	60.0	W	No
Bedroom 1	CAP-061-06 A	Opening 21	2400	2665	awning	60.0	W	No
WIR	CAP-061-06 A	Opening 20	2400	880	awning	60.0	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
Velux:VEL-011-01 W	VELUX FS - Fixed Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La	2.58	0.24	0.23	0.25

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	Orientation	Outdoor shade	Indoor shade
Ensuite	Velux:VEL-011-01 W	Element 1	0.0	0.9	N	None	None

Skylight *type and performance*

Skylight ID	Skylight description
No Data Available	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m²)	Orient-ation	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	Waverley Avenue - Lightweight	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

* Refer to glossary.

2	Waverley Avenue - Int Cncrete Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
3	FR5 - Internal Plasterboard Stud Wall	0.3	Light	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living	1	2800	10562	N	0	Yes
Kitchen/Living	1	2800	5140	W	0	Yes
Kitchen/Living	1	2800	6205	E	0	Yes
Bedroom 3	1	2800	3804	E	0	Yes
Laundry	1	2800	2147	E	0	Yes
PDR	2	2800	2395	S	0	No
PDR	1	2800	1420	E	0	Yes
Pantry	1	2800	1961	W	0	Yes
Bedroom 2	1	2800	4288	W	0	Yes
Bedroom 1	1	2800	3788	W	0	Yes
Bedroom 1	3	2800	3668	S	0	No
WIR	1	2800	2710	W	0	Yes
Ensuite	3	2800	2285	E	0	No
Ensuite	3	2800	1793	S	0	No
Hallway	3	2800	2345	S	0	No
Hallway	3	2800	2271	E	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	159.9	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living	FR5 - 200mm concrete slab	68.6	Enclosed	R0.0	Timber
Bedroom 3	FR5 - 200mm concrete slab	13.6	Enclosed	R0.0	Carpet
Laundry	FR5 - 200mm concrete slab	7.8	Enclosed	R0.0	Carpet
PDR	FR5 - 200mm concrete slab	3.3	Enclosed	R0.0	Tiles
Pantry	FR5 - 200mm concrete slab	3.5	Enclosed	R0.0	Timber
Bedroom 2	FR5 - 200mm concrete slab	17.3	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	4.4	Enclosed	R0.0	Tiles
Bedroom 1	FR5 - 200mm concrete slab	20.6	Enclosed	R0.0	Carpet
WIR	FR5 - 200mm concrete slab	6.4	Enclosed	R0.0	Tiles
Ensuite	FR5 - 200mm concrete slab	7.9	Enclosed	R0.0	Carpet
Hallway	FR5 - 200mm concrete slab	16.6	Enclosed	R0.0	Timber

* Refer to glossary.

Ceiling *type*

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

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living	27	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	250	Sealed
Bedroom 3	5	Downlights	80	Sealed
Laundry	3	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
PDR	1	Downlights	80	Sealed
PDR	1	Exhaust Fans	250	Sealed
Pantry	2	Downlights	80	Sealed
Bedroom 2	7	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	250	Sealed
Bedroom 1	8	Downlights	80	Sealed
WIR	3	Downlights	80	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
Hallway	6	Downlights	80	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
Kitchen/Living	1	900
Bedroom 3	1	900
Laundry	1	900
Bedroom 2	1	900
Bedroom 1	1	900

* Refer to glossary.

Roof *type*

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

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

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 NatHERSAdministrator. 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.

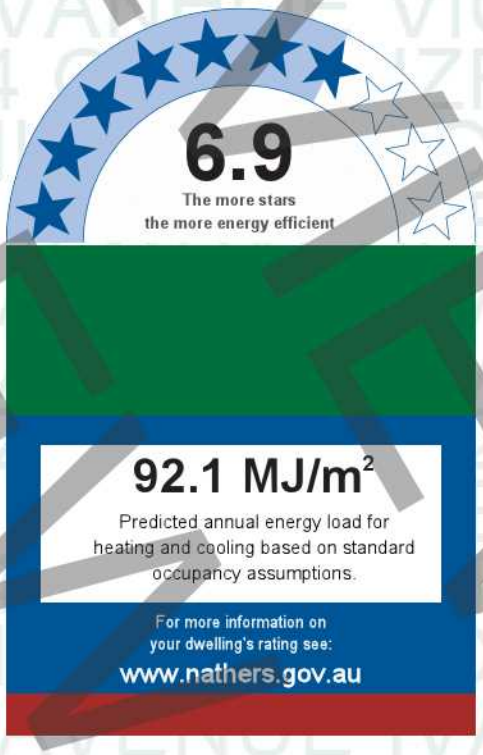
Glossary

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.

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 30 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	2.02, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	151
Unconditioned*	8.1
Total	159.1
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
73.7 MJ/m²	18.4 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.

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Additional Notes

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
CAP-057-13 A	Capral 900 Sliding Door DG 6EA/12Ar/6	3.19	0.48	0.46	0.5

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living	CAP-061-06 A	Opening 31	2400	890	awning	45.0	W	No

* Refer to glossary.

Kitchen/Living	CAP-057-13 A	Opening 13	2700	3300	sliding	60.0	S	Yes
Kitchen/Living	CAP-057-13 A	Opening 22	2700	3300	sliding	60.0	S	Yes
Kitchen/Living	CAP-057-13 A	Opening 24	2700	1800	sliding	45.0	S	Yes
Bedroom 3	CAP-061-06 A	Opening 16	2400	2665	awning	30.0	E	No
Laundry	CAP-061-06 A	Opening 17	2400	880	awning	45.0	E	No
Bedroom 2	CAP-061-06 A	Opening 19	2400	2665	awning	60.0	W	No
Bedroom 1	CAP-061-06 A	Opening 21	2400	2665	awning	60.0	W	No
WIR	CAP-061-06 A	Opening 20	2400	880	awning	60.0	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
Velux:VEL-011-01 W	VELUX FS - Fixed Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La	2.58	0.24	0.23	0.25

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	Orientation	Outdoor shade	Indoor shade
Ensuite	Velux:VEL-011-01 W	Element 1	0.0	0.9	N	None	None

Skylight *type and performance*

Skylight ID	Skylight description
No Data Available	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m²)	Orient-ation	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	Waverley Avenue - Lightweight	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

* Refer to glossary.

2	Waverley Avenue - Int Cncrete Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
3	FR5 - Internal Plasterboard Stud Wall	0.3	Light	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Kitchen/Living	1	2800	4551	E	0	Yes
Kitchen/Living	1	2800	5887	W	0	Yes
Kitchen/Living	1	2800	10611	S	0	Yes
Bedroom 3	1	2800	3772	E	0	Yes
Laundry	1	2800	2243	E	0	Yes
PDR	1	2800	1274	E	0	Yes
PDR	2	2800	2421	N	0	No
Pantry	1	2800	1929	E	0	Yes
Bedroom 2	1	2800	4266	W	0	Yes
Bedroom 1	3	2800	3624	N	0	No
Bedroom 1	1	2800	3805	W	0	Yes
WIR	1	2800	2776	W	0	Yes
Ensuite	3	2800	1793	N	0	No
Ensuite	3	2800	2771	E	0	No
Hallway	3	2800	127	ENE	0	Yes
Hallway	3	2800	2339	N	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	160.9	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Kitchen/Living	FR5 - 200mm concrete slab	60.8	Enclosed	R0.0	Timber
Bedroom 3	FR5 - 200mm concrete slab	13.7	Enclosed	R0.0	Carpet
Laundry	FR5 - 200mm concrete slab	8.1	Enclosed	R0.0	Carpet
PDR	FR5 - 200mm concrete slab	3.1	Enclosed	R0.0	Tiles
Pantry	FR5 - 200mm concrete slab	3.5	Enclosed	R0.0	Timber
Bedroom 2	FR5 - 200mm concrete slab	17.3	Enclosed	R0.0	Carpet
Bathroom	FR5 - 200mm concrete slab	4.4	Enclosed	R0.0	Tiles
Bedroom 1	FR5 - 200mm concrete slab	20.3	Enclosed	R0.0	Carpet
WIR	FR5 - 200mm concrete slab	6.5	Enclosed	R0.0	Tiles
Ensuite	FR5 - 200mm concrete slab	7.8	Enclosed	R0.0	Carpet
Hallway	FR5 - 200mm concrete slab	13.6	Enclosed	R0.0	Timber

* Refer to glossary.

Ceiling *type*

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

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living	27	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	250	Sealed
Bedroom 3	5	Downlights	80	Sealed
Laundry	3	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
PDR	1	Downlights	80	Sealed
PDR	1	Exhaust Fans	250	Sealed
Pantry	2	Downlights	80	Sealed
Bedroom 2	7	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	250	Sealed
Bedroom 1	8	Downlights	80	Sealed
WIR	3	Downlights	80	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
Hallway	6	Downlights	80	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
Kitchen/Living	1	900
Bedroom 3	1	900
Laundry	1	900
Bedroom 2	1	900
Bedroom 1	1	900

* Refer to glossary.

Roof *type*

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

Explanatory Notes

About this report

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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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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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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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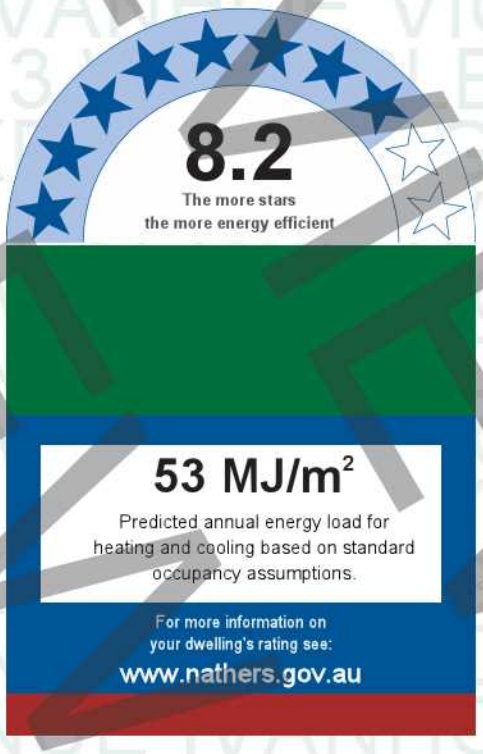
Nationwide House Energy Rating Scheme
NatHERS Certificate

Generated on 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	G.01, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	181.3
Unconditioned*	0
Total	181.3
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
45.5 MJ/m²	7.5 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.

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.

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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
CAP-055-52 A	Capral 419 Flushline Fixed Window DG 6/12Ar/6EA	2.71	0.58	0.55	0.61

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Bedroom 23	CAP-057-13 A	Opening 86	2700	3159	sliding	45.0	N	Yes
WIR	CAP-061-06 A	Opening 79	2700	882	awning	30.0	E	No
Bedroom 26	CAP-055-52 A	Opening 85	2700	1482	fixed	0.0	S	No
Bedroom 26	CAP-061-06 A	Opening 80	2700	1797	awning	30.0	E	No
Bedroom 29	CAP-055-52 A	Opening 83	2700	1490	fixed	0.0	N	No
Bedroom 29	CAP-061-06 A	Opening 82	2700	1786	awning	30.0	E	No
Kitchen/Living 32	CAP-057-13 A	Opening 74	2700	4300	sliding	45.0	N	Yes
Kitchen/Living 32	CAP-055-52 A	Opening 75	2700	4217	fixed	0.0	N	Yes

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 (m²)	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 (m²)	Orient-ation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Laundry	2400	849	100.0	W

External wall *type*

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

1	Waverley Avenue - Brick Wall	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
2	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
3	FR5 - Internal Plasterboard Stud Wall	0.3	Light	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
4	Waverley Avenue - Int Cncrete Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
5	Waverley Avenue - Internal Plasterboard Stud Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 23	1	3000	3691	N	214	Yes
WIR	1	3000	1632	N	0	Yes
WIR	2	3000	3741	E	0	Yes
WIR	2	3000	916	E	0	Yes
WIR	2	3000	1331	E	588	Yes
WIR	1	3000	2379	E	497	Yes
Bedroom 26	2	3000	1678	S	0	Yes
Bedroom 26	2	3000	1146	E	0	Yes
Bedroom 26	2	3000	1818	E	0	Yes
Bedroom 26	2	3000	406	E	0	Yes
Bathroom	2	3000	1458	E	0	Yes
Bedroom 29	2	3000	1677	N	0	Yes
Bedroom 29	3	3000	103	N	0	Yes
Bedroom 29	4	3000	2418	S	0	No
Bedroom 29	2	3000	1539	S	0	No
Bedroom 29	2	3000	781	S	2989	Yes
Bedroom 29	2	3000	279	E	0	Yes
Bedroom 29	2	3000	1816	E	0	Yes
Bedroom 29	2	3000	1361	E	0	Yes
Hallway	5	3000	9288	W	0	No
Hallway	5	3000	1988	S	0	No
Hallway	4	3000	621	E	0	No
Hallway	3	3000	291	W	0	Yes
Kitchen/Living 32	1	3000	10059	N	227	Yes
Kitchen/Living 32	1	3000	346	N	0	Yes
Kitchen/Living 32	1	3000	2447	W	0	Yes
Kitchen/Living 32	2	3000	3215	W	0	Yes
Kitchen/Living 32	5	3000	4460	S	0	No
Laundry	2	3000	2352	W	0	Yes

* Refer to glossary.

Laundry	5	3000	2058	S	0	No
Pantry	5	3000	2051	S	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	168.1	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 23	FR5 - 300mm concrete slab	11.5	Enclosed	R2.3	Carpet
Bedroom 23	FR5 - 300mm concrete slab	1.4	Enclosed	R2.3	Carpet
Bedroom 23	FR5 - 300mm concrete slab	7.6	Enclosed	R2.3	Carpet
WIR	FR5 - 300mm concrete slab	9.5	Enclosed	R2.3	Tiles
WIR	FR5 - 300mm concrete slab	4	Enclosed	R2.3	Tiles
Ensuite	FR5 - 300mm concrete slab	7.6	Enclosed	R2.3	Carpet
Bedroom 26	FR5 - 300mm concrete slab	14.6	Enclosed	R2.3	Carpet
Powder Room	FR5 - 300mm concrete slab	2.8	Enclosed	R2.3	Tiles
Bathroom	FR5 - 300mm concrete slab	4.4	Enclosed	R2.3	Tiles
Bedroom 29	FR5 - 300mm concrete slab	16.4	Enclosed	R2.3	Carpet
Hallway	FR5 - 300mm concrete slab	22.7	Enclosed	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	1.8	Enclosed	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	19.9	Enclosed	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	24.9	Enclosed	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	0.5	Elevated	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	1.7	Enclosed	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	1.4	Elevated	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	7.4	Elevated	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	13	Enclosed	R2.3	Timber
Kitchen/Living 32	FR5 - 300mm concrete slab	0	Enclosed	R2.3	Timber
Laundry	FR5 - 300mm concrete slab	4.8	Enclosed	R2.3	Timber
Pantry	FR5 - 300mm concrete slab	3.5	Enclosed	R2.3	Timber

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 23	Plasterboard	R2.3	No
Bedroom 23	Plasterboard	R2.3	No
WIR	Plasterboard	R2.3	No
Kitchen/Living 32	Plasterboard	R2.3	No
Kitchen/Living 32	Plasterboard	R2.3	No
Kitchen/Living 32	Plasterboard	R2.3	No
Kitchen/Living 32	Plasterboard	R2.3	No

* Refer to glossary.

Kitchen/Living 32	Plasterboard	R2.3	No
Kitchen/Living 32	Plasterboard	R2.3	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 23	7	Downlights	80	Sealed
WIR	4	Downlights	80	Sealed
WIR	1	Exhaust Fans	250	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
Bedroom 26	6	Downlights	80	Sealed
Powder Room	2	Downlights	80	Sealed
Powder Room	1	Exhaust Fans	250	Sealed
Bathroom	3	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	250	Sealed
Bedroom 29	6	Downlights	80	Sealed
Hallway	8	Downlights	80	Sealed
Kitchen/Living 32	26	Downlights	80	Sealed
Kitchen/Living 32	1	Exhaust Fans	250	Sealed
Laundry	1	Exhaust Fans	250	Sealed
Laundry	2	Downlights	80	Sealed
Pantry	2	Downlights	80	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 300mm: 300mm Suspended Slab	0.0	0.5	Medium

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NatHERS Certificate

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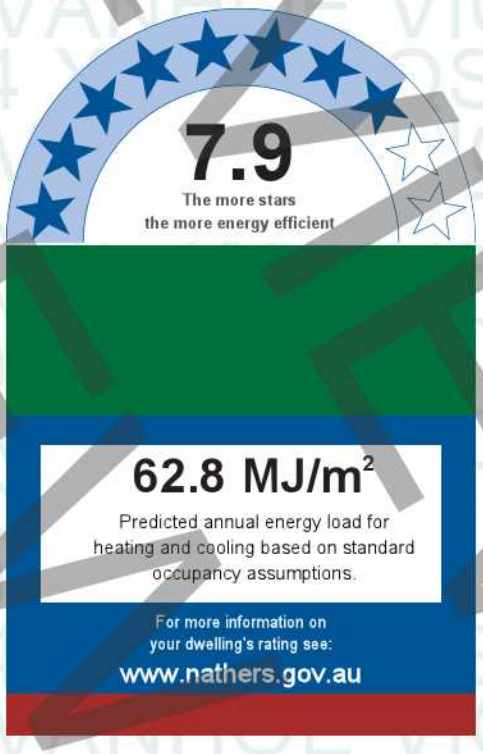

Property

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NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	138.4
Unconditioned*	4.3
Total	142.7
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
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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

Verification

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National Construction Code (NCC) requirements

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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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
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-061-06 A	Opening 18	2700	1772	awning	30.0	W	No

* Refer to glossary.

Bedroom 2	CAP-061-06 A	Opening 19	2700	1807	awning	30.0	W	No
Bedroom 1	CAP-061-06 A	Opening 20	2700	1823	awning	30.0	W	No
Kitchen/Living	CAP-057-13 A	Opening 22	2700	5400	sliding	45.0	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 (m²)	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 (m²)	Orient-ation	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	0.3	Light	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
2	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

External wall *schedule*

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

Ensuite Bed 3	1	3000	1779	N	0	No
Ensuite Bed 3	1	3000	3757	E	0	No
WIR Bed 3	1	3000	3093	N	0	No
Bedroom 3	1	3000	4173	N	0	No
Bedroom 3	2	3000	1868	W	0	Yes
Bedroom 3	2	3000	1902	W	0	Yes
Laundry	1	3000	1729	E	0	No
Bedroom 2	2	3000	1360	W	0	Yes
Bedroom 2	2	3000	1836	W	0	Yes
Bedroom 2	2	3000	318	W	0	Yes
Bedroom 2	2	3000	997	S	0	Yes
Bedroom 1	2	3000	1072	W	0	Yes
Bedroom 1	2	3000	1840	W	0	Yes
Bedroom 1	2	3000	217	W	0	Yes
Bathroom	1	3000	454	S	0	No
Bathroom	1	3000	3031	E	0	No
Kitchen/Living	2	3000	6764	W	0	Yes
Kitchen/Living	1	3000	7802	S	0	No
Kitchen/Living	1	3000	8657	E	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	140.3	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Ensuite Bed 3	FR5 - 250mm concrete slab	6.7	Enclosed	R2.3	Tiles
WIR Bed 3	FR5 - 250mm concrete slab	6.9	Enclosed	R2.3	Carpet
Bedroom 3	FR5 - 250mm concrete slab	20.2	Enclosed	R2.3	Carpet
Laundry	FR5 - 250mm concrete slab	4.3	Enclosed	R2.3	Tiles
Bedroom 2	FR5 - 250mm concrete slab	17.3	Enclosed	R2.3	Carpet
Bedroom 1	FR5 - 250mm concrete slab	13.5	Enclosed	R2.3	Carpet
Bathroom	FR5 - 250mm concrete slab	4.5	Enclosed	R2.3	Tiles
Hallway	FR5 - 250mm concrete slab	9.2	Enclosed	R2.3	Timber
Kitchen/Living	FR5 - 250mm concrete slab	58.5	Enclosed	R2.3	Timber
Powder Room	FR5 - 250mm concrete slab	1.7	Enclosed	R2.3	Tiles

Ceiling *type*

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

* Refer to glossary.

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Ensuite Bed 3	4	Downlights	80	Sealed
Ensuite Bed 3	1	Exhaust Fans	250	Sealed
WIR Bed 3	2	Downlights	80	Sealed
Bedroom 3	6	Downlights	80	Sealed
Laundry	3	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
Bedroom 2	6	Downlights	80	Sealed
Bedroom 1	5	Downlights	80	Sealed
Bathroom	3	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	250	Sealed
Hallway	4	Downlights	80	Sealed
Kitchen/Living	24	Downlights	80	Sealed
Kitchen/Living	1	Exhaust Fans	250	Sealed
Powder Room	1	Downlights	80	Sealed
Powder Room	1	Exhaust Fans	250	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 : 250mm: 250mm Suspended Slab	0.0	0.5	Medium

* Refer to glossary.

Explanatory Notes

About this report

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

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

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

Accredited assessors

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

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

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 NatHERSAdministrator. 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.

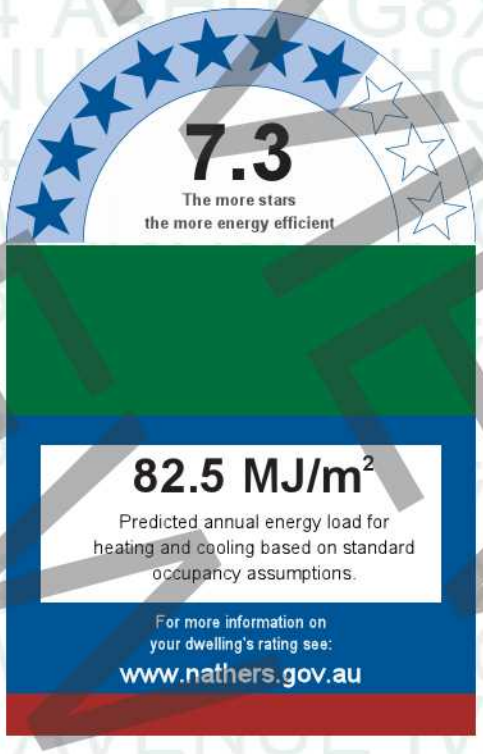
Glossary

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.

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 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	G.03, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	141.4
Unconditioned*	2.8
Total	144.2
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
73.9 MJ/m²	8.6 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.

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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".

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Additional Notes

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42
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-061-06 A	Opening 73	2700	1775	awning	30.0	W	No

* Refer to glossary.

Bedroom 5	CAP-061-06 A	Opening 76	2700	1796	awning	30.0	W	No
Bedroom 6	CAP-061-06 A	Opening 77	2700	1766	awning	30.0	W	No
Kitchen/Living 10	CAP-061-06 A	Opening 79	2700	895	awning	30.0	W	No
Kitchen/Living 10	CAP-061-06 A	Opening 80	2700	1785	awning	30.0	W	No
Kitchen/Living 10	CAP-057-13 A	Opening 82	2700	4900	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 (m²)	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 (m²)	Orient-ation	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	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No
2	Waverley Avenue - Internal Plasterboard Stud Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 1	1	3000	789	W	0	Yes
Bedroom 1	1	3000	1376	W	0	Yes
Bedroom 1	1	3000	1835	W	0	Yes
Bedroom 1	1	3000	289	W	0	Yes
Bedroom 1	2	3000	3391	N	0	No
WIR	2	3000	1520	N	0	No
Ensuite	2	3000	1805	N	0	No
Hallway	2	3000	2086	N	0	No
Hallway	2	3000	4153	E	0	No
Hallway	2	3000	925	S	0	No
Hallway	2	3000	1735	E	0	No
Bedroom 5	1	3000	1265	W	0	Yes
Bedroom 5	1	3000	1834	W	0	Yes
Bedroom 5	1	3000	221	W	0	Yes
Bedroom 6	1	3000	1399	W	0	Yes
Bedroom 6	1	3000	1791	W	0	Yes
Bedroom 6	1	3000	268	W	0	Yes
Kitchen/Living 10	1	3000	225	W	0	Yes
Kitchen/Living 10	1	3000	929	W	0	Yes
Kitchen/Living 10	1	3000	3767	W	0	Yes
Kitchen/Living 10	1	3000	1814	W	0	Yes
Kitchen/Living 10	1	3000	578	W	0	Yes
Kitchen/Living 10	1	3000	5721	S	0	Yes
Kitchen/Living 10	2	3000	4607	E	0	No
Pantry	1	3000	1437	S	0	Yes
Pantry	1	3000	340	S	0	Yes
Pantry	2	3000	1649	E	0	No
Bathroom	2	3000	2962	E	0	No
Laundry	2	3000	714	S	0	No
Laundry	2	3000	3092	E	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	172.3	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - 300mm concrete slab	1.7	Enclosed	R2.3	Carpet
Bedroom 1	FR5 - 300mm concrete slab	14.5	Enclosed	R2.3	Carpet

* Refer to glossary.

WIR	FR5 - 300mm concrete slab	4.8	Enclosed	R2.3	Carpet
Ensuite	FR5 - 300mm concrete slab	6.6	Enclosed	R2.3	Tiles
Hallway	FR5 - 300mm concrete slab	18.2	Enclosed	R2.3	Timber
Bedroom 5	FR5 - 300mm concrete slab	2.6	Enclosed	R2.3	Carpet
Bedroom 5	FR5 - 300mm concrete slab	10	Enclosed	R2.3	Carpet
Bedroom 6	FR5 - 300mm concrete slab	0.2	Enclosed	R2.3	Carpet
Bedroom 6	FR5 - 300mm concrete slab	13.4	Enclosed	R2.3	Carpet
Laundry	FR5 - 300mm concrete slab	2.8	Enclosed	R2.3	Tiles
Kitchen/Living 10	FR5 - 300mm concrete slab	14.6	Enclosed	R2.3	Timber
Kitchen/Living 10	FR5 - 300mm concrete slab	22.7	Enclosed	R2.3	Timber
Kitchen/Living 10	FR5 - 300mm concrete slab	16.8	Enclosed	R2.3	Timber
Pantry	FR5 - 300mm concrete slab	3	Enclosed	R2.3	Timber
Linen	FR5 - 300mm concrete slab	3.1	Enclosed	R2.3	Tiles
Bathroom	FR5 - 300mm concrete slab	4.7	Enclosed	R2.3	Tiles
Laundry	FR5 - 300mm concrete slab	4.8	Enclosed	R2.3	Tiles

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 1	Plasterboard	R2.3	No
Bedroom 5	Plasterboard	R2.3	No
Kitchen/Living 10	Plasterboard	R2.3	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bedroom 1	5	Downlights	80	Sealed
WIR	2	Downlights	80	Sealed
Ensuite	3	Downlights	80	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
Hallway	6	Downlights	80	Sealed
Bedroom 5	5	Downlights	80	Sealed
Bedroom 6	5	Downlights	80	Sealed
Laundry	1	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
Kitchen/Living 10	22	Downlights	80	Sealed
Kitchen/Living 10	1	Exhaust Fans	250	Sealed
Pantry	1	Downlights	80	Sealed
Linen	1	Downlights	80	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	250	Sealed
Laundry	2	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed

* Refer to glossary.

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 300mm: 300mm Suspended Slab	0.0	0.5	Medium

Explanatory Notes

About this report

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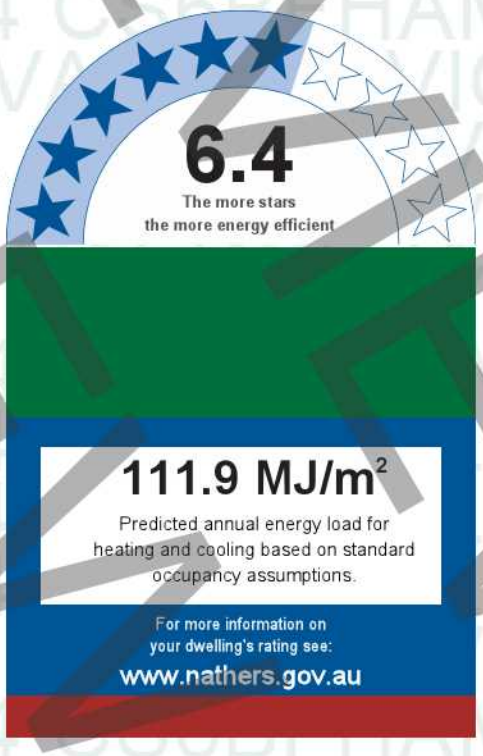
Glossary

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.
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.

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 11 Oct 2024 using FirstRate5: 5.3.2b (3.21)



Property

Address	G.04, 3 Waverley Avenue, Ivanhoe , VIC, 3079
Lot/DP	-
NCC Class*	Class 2
Type	New Home

Plans

Main plan	22022/RevA/01012022
Prepared by	KUD Architecture

Construction and environment

Assessed floor area (m²)*	
Conditioned*	125.3
Unconditioned*	2.1
Total	127.4
Garage	-

Exposure type
suburban

NatHERS climate zone
62 Moorabbin Airport

Thermal performance

Heating	Cooling
106.4 MJ/m²	5.5 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.

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.

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

- Load background with snappable points feature did not work.

- Insulation to the walls are selected from the specified conductivity list and adjusted the thickness accordingly as there are limitation to select the required insulation values from the specific conductivity default list.

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-061-06 A	Capral 50 Series Awning in 400 Series DG 6EA-12Ar-6	4.42	0.4	0.38	0.42

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Kitchen/Living 13	CAP-057-13 A	Opening 83	2700	4880	sliding	45.0	S	No

* Refer to glossary.

Kitchen/Living 13	CAP-061-06 A	Opening 81	2700	1793	awning	30.0	E	No
Kitchen/Living 13	CAP-061-06 A	Opening 79	2700	1776	awning	30.0	E	No
Bedroom 15	CAP-061-06 A	Opening 77	2700	1726	awning	30.0	E	No
Bedroom 16	CAP-061-06 A	Opening 76	2700	900	awning	30.0	E	No
Bedroom 16	CAP-061-06 A	Opening 75	2700	865	awning	30.0	E	No
Bedroom 20	CAP-061-06 A	Opening 74	2700	900	awning	30.0	E	No
Bedroom 20	CAP-061-06 A	Opening 73	2700	900	awning	30.0	E	No

Roof window *type and performance value*

Default* roof windows

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

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	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 (m²)	Orient-ation	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	Waverley Avenue - Internal Plasterboard Stud Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)	No
2	Waverley Avenue - Lightweight (con finish)	0.7	Dark	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

* Refer to glossary.

3	Waverley Avenue - Int Cncrete Wall	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.8)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Pantry	1	3000	1554	W	0	No
Pantry	2	3000	2428	S	0	Yes
Kitchen/Living 13	1	3000	5102	W	0	No
Kitchen/Living 13	2	3000	5521	S	0	Yes
Kitchen/Living 13	2	3000	1945	E	0	Yes
Kitchen/Living 13	2	3000	909	E	0	Yes
Kitchen/Living 13	2	3000	1803	E	0	Yes
Kitchen/Living 13	2	3000	2100	E	0	Yes
Kitchen/Living 13	1	3000	1806	N	0	No
Bedroom 15	2	3000	1245	E	0	Yes
Bedroom 15	2	3000	1767	E	0	Yes
Bedroom 15	2	3000	676	E	0	Yes
Bedroom 16	2	3000	727	E	0	Yes
Bedroom 16	2	3000	916	E	0	Yes
Bedroom 16	2	3000	1086	E	0	Yes
Bedroom 16	2	3000	834	E	0	Yes
Ensuite	3	3000	2547	N	0	No
Ensuite	2	3000	2077	E	0	Yes
WIR	3	3000	2262	N	0	No
WIR	1	3000	917	W	0	No
Bedroom 20	2	3000	839	E	0	Yes
Bedroom 20	2	3000	1303	E	0	Yes
Bedroom 20	2	3000	937	E	0	Yes
Hallway	1	3000	1235	N	0	No
Hallway	1	3000	11650	W	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	122.7	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)
2	Waverley Avenue - Internal Plasterboard Stud Wall	18	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Pantry	FR5 - 300mm concrete slab	3.8	Enclosed	R2.3	Timber
Kitchen/Living 13	FR5 - 300mm concrete slab	37	Enclosed	R2.3	Timber

* Refer to glossary.

Kitchen/Living 13	FR5 - 300mm concrete slab	13.3	Enclosed	R2.3	Timber
Bathroom	FR5 - 300mm concrete slab	4.1	Enclosed	R2.3	Tiles
Bedroom 15	FR5 - 300mm concrete slab	11.4	Enclosed	R2.3	Carpet
Bedroom 16	FR5 - 300mm concrete slab	11.1	Enclosed	R2.3	Carpet
Laundry	FR5 - 300mm concrete slab	4.4	Enclosed	R2.3	Tiles
Ensuite	FR5 - 300mm concrete slab	5.3	Enclosed	R2.3	Tiles
WIR	FR5 - 300mm concrete slab	4.6	Enclosed	R2.3	Carpet
Bedroom 20	FR5 - 300mm concrete slab	12.7	Enclosed	R2.3	Carpet
WC	FR5 - 300mm concrete slab	2.1	Enclosed	R2.3	Tiles
Hallway	FR5 - 300mm concrete slab	17.6	Enclosed	R2.3	Timber

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Pantry	Plasterboard	R2.3	No
Kitchen/Living 13	Plasterboard	R2.3	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Pantry	1	Downlights	80	Sealed
Kitchen/Living 13	20	Downlights	80	Sealed
Kitchen/Living 13	1	Exhaust Fans	250	Sealed
Bathroom	2	Downlights	80	Sealed
Bathroom	1	Exhaust Fans	250	Sealed
Bedroom 15	4	Downlights	80	Sealed
Bedroom 16	4	Downlights	80	Sealed
Laundry	2	Downlights	80	Sealed
Laundry	1	Exhaust Fans	250	Sealed
Ensuite	2	Downlights	80	Sealed
WIR	2	Downlights	80	Sealed
Bedroom 20	5	Downlights	80	Sealed
WC	1	Downlights	80	Sealed
WC	1	Exhaust Fans	250	Sealed
Hallway	7	Downlights	80	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Slab:Slab - Suspended Slab : 300mm: 300mm Suspended Slab	0.0	0.5	Medium

* Refer to glossary.

Explanatory Notes

About this report

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

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

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

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Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
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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: Renewable Energy

Solar PV

Inputs Solar PV

Peak Wattage of System	15.0	kWp
Azimuth	0	degrees
Inclination	30	degrees

Outputs Solar PV

Electricity Produced per Year	21,624	kWh
No. Panels Required	36	
Total Roof Area Required	91	sqm
Annual Carbon Savings	24,219	kg CO2

Economic Output

Cost of System	22,500	$
Annual Savings	4,325	$
Simple Payback	5	Years

Annual Common Area Demand

Annual Demand Class 2 Non-Residential Areas	3,497	kWh/year
Annual Demand Carpark / Services	22,336	kWh/year
Total Annual Demand	25,833	kWh/year

Demand / Supply

Contribution Solar PV to Communal Area Power	84%

Appendix D: Breeze Pathways

- 3 BEDROOM
- BIN ROOM
- CORE
- CORRIDOR
- SERVICES

NOTES:

- ALL BALCONIES & P.O.S HAVE BEEN PROVIDED WITH A TAP & FLOOR WASTE
-THE PROJECT SITE SLOPES MORE THAN 2.5 DEGREES OVER AN AREA OF 9 METRES
-ROOF MATERIAL TO HAVE A THREE-YEAR SRI OF MINIMUM 60.
-UNSHADED HARD-SCAPING ELEMENTS TO HAVE A THREE-YEAR SRI OF MINIMUM 40.

URBAN DESIGN ITEMS INCORPORATED

1. CENTRALLY LOCATED DOUBLE WIDTH CROSS OVER HAS BEEN REDUCED.
6. DD012 SATISFIED BY REPLACING THE PROPOSED BRONZE CLADDING WITH A 'MUTED' PALE BRONZE CLADDING
7. ALL BOUNDARY AND INTERNAL FENCINGS ARE TO BE NO HIGHER THAN 2.1M ABOVE NGL.

LANDSCAPE DESIGN

REFER TO LANDSCAPE ARCHITECT DOCUMENTATION FOR ALL LANDSCAPING, PLANTING DETAILS

EXTERNAL LIGHTING

EXTERNAL LIGHTING IS TO BE DESIGNED TO INCLUDE MEASURES TO AVOID DIRECT LIGHT GLARE TO ADJOINING LAND AT 1 WAVERLEY AVENUE TO TEHE EAST

KUD
Architecture.
Interior. Planning.
Urban Design. Art.
Unit 1/76-78 Balmain St.
Cremorne, Victoria, 3121
Australia
+61 3 9429 4733
enquiries@kud.com.au
kud.com.au

REVISION	ISSUE	CHECKED	DATE
A	FOR SUBMISSION	RH	08.10.2024

DRAWING LEGEND:

FI	- FOR INFORMATION
SK	- SCHEMATIC DESIGN
TP	- TOWN PLANNING
TP-E	- TOWN PLANNING - ENDORSEMENT
TP-A	- TOWN PLANNING - AMENDMENT
VCAT	- VIC. CIVIL & ADMIN. TRIBUNAL
DD	- DESIGN DEVELOPMENT
TI	- TENDER ISSUE
MK	- MARKETING
BP	- BUILDING PERMIT
IFC	- ISSUE FOR CONSTRUCTION
HO	- HANDOVER

ISSUE FOR TOWN PLANNING

GIW environmental SOLUTIONS
Breeze Pathways 11/10/2024

TITLE:
LEVEL 00 PROPOSED GA PLAN
ADDRESS:
3 WAVERLEY AVENUE, IVANHOE
CLIENT:
MELBOURNE DEVELOPMENT AQUISITIONS

PROJECT NO.	START DATE:	DATE DRAWN:	DRAWN:	REV:	SCALE:	SHEET NO.
22-022	01.01.2022	9/10/2024 5:15:19 PM	RE	A	1 : 100@A1	TP301

- 3 BEDROOM
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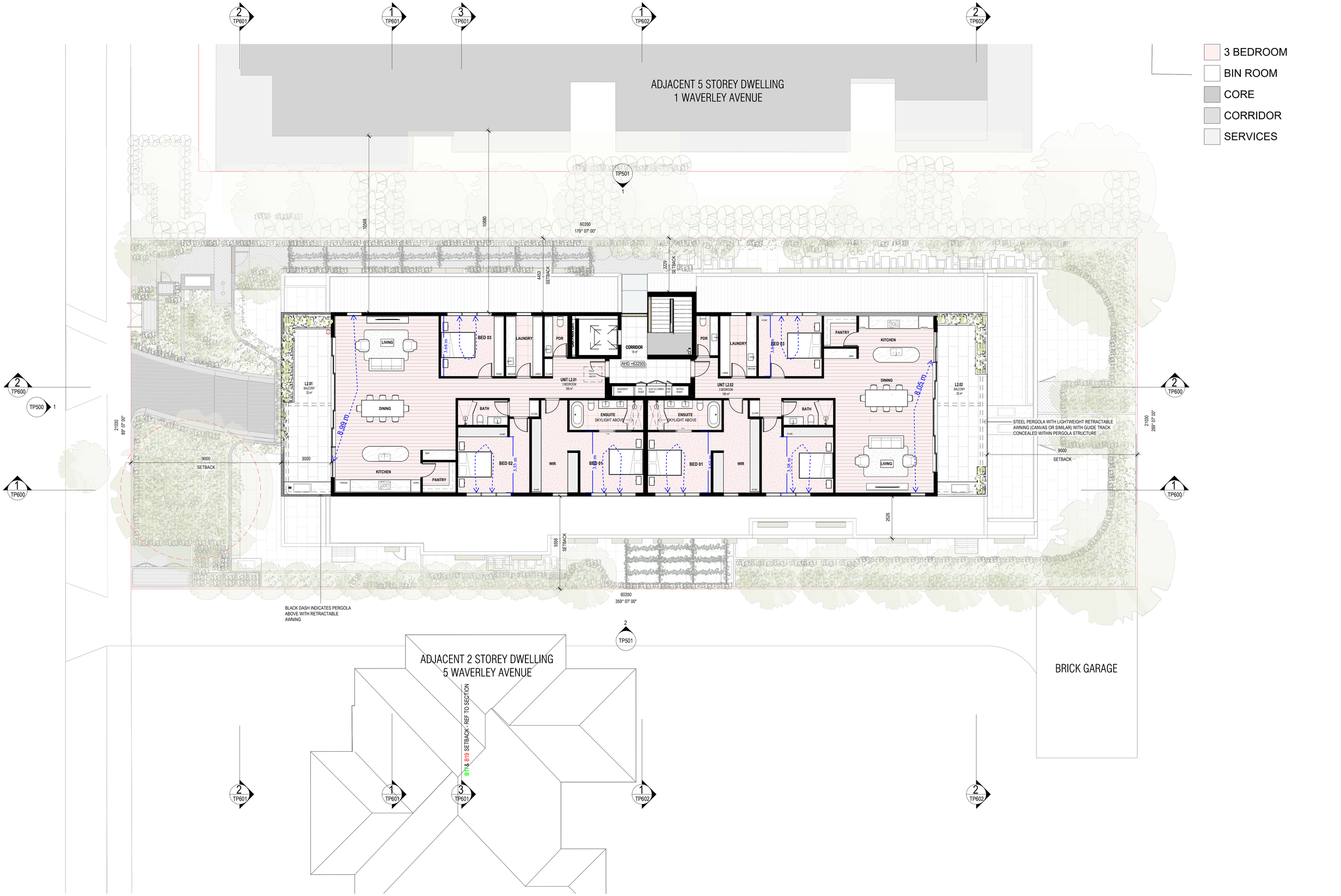
MK	- MARKETING
BP	- BUILDING PERMIT
IFC	- ISSUE FOR CONSTRUCTION
HO	- HANDOVER

ISSUE FOR TOWN PLANNING

GIW environmental SOLUTIONS
Breeze Pathways 11/10/2024

TITLE:
LEVEL 01 PROPOSED GA PLAN
ADDRESS:
3 WAVERLEY AVENUE, IVANHOE
CLIENT:
MELBOURNE DEVELOPMENT AQUISITIONS

PROJECT NO.	START DATE:	DATE DRAWN:	DRAWN:	REV:	SCALE:	SHEET NO.
22-022	01.01.2022	9/10/2024 5:18:58 PM	RE	A	1 : 100@A1	TP302



REVISION	ISSUE	CHECKED	DATE
A	FOR SUBMISSION	RH	18.10.2024

DRAWING LEGEND:

FI	- FOR INFORMATION
SK	- SCHEMATIC DESIGN
TP	- TOWN PLANNING
TP-E	- TOWN PLANNING - ENDORSEMENT
TP-A	- TOWN PLANNING - AMENDMENT
VCAT	- VIC. CIVIL & ADMIN. TRIBUNAL
DD	- DESIGN DEVELOPMENT
TI	- TENDER ISSUE
MK	- MARKETING
BP	- BUILDING PERMIT
IFC	- ISSUE FOR CONSTRUCTION
HO	- HANDOVER

ISSUE FOR TOWN PLANNING

KUD
Architecture.
Interior. Planning.
Urban Design. Art.
Unit 1/76-78 Balmain St.
Cremorne, Victoria, 3121
Australia
+61 3 9429 4733
enquiries@kud.com.au
kud.com.au

TITLE:
LEVEL 02 PROPOSED GA PLAN
ADDRESS:
3 WAVERLEY AVENUE, IVANHOE
CLIENT:
MELBOURNE DEVELOPMENT AQUISITIONS

PROJECT NO.	START DATE:	DATE DRAWN:	DRAWN:	REV:	SCALE:	SHEET NO.
22-022	01.01.2022	25/10/2024 1:55:52 PM	RE	A	1 : 100@A1	TP303

Appendix E: BESS Assessment

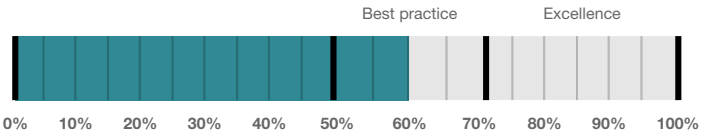
BESS Report

Built Environment Sustainability Scorecard

This BESS report outlines the sustainable design commitments of the proposed development at 3 Waverley Ave Ivanhoe Victoria 3079. 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 Banyule 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

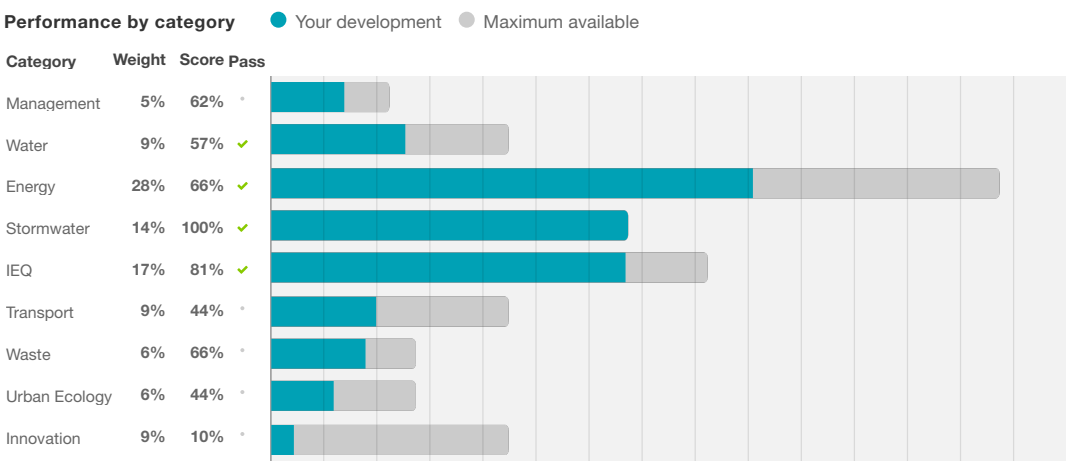


64%

Project details

Address	3 Waverley Ave Ivanhoe Victoria 3079
Project no	A328668B-R8
BESS Version	BESS-7
Site type	Multi unit development (apartment building)
Account	info@giw.com.au
Application no.	
Site area	1,269.00 m²
Building floor area	1,628.00 m²
Date	30 October 2024
Software version	2.0.1-B.570

Performance by category



Buildings

Name	Height	Footprint	% of total footprint
Apartment Building	3	1,694 m²	100%

Dwellings & Non Res Spaces

Dwellings

Name	Quantity	Area	Building	% of total area
Apartment				
G.01	1	202 m²	Apartment Building	12%
L2.02	1	184 m²	Apartment Building	11%
L2.01	1	189 m²	Apartment Building	11%
L1.04	1	149 m²	Apartment Building	9%
L1.02	1	149 m²	Apartment Building	9%
G.04	1	148 m²	Apartment Building	9%
G.03	1	162 m²	Apartment Building	9%
G.02	1	159 m²	Apartment Building	9%
L1.03	1	144 m²	Apartment Building	8%
L1.01	1	142 m²	Apartment Building	8%
Total	**10**	**1,628 m²**	**100%**	

Supporting information

Floorplans & elevation notes

Credit	Requirement	Response	Status
Management 3.1	Annotation: Individual utility meters to be provided to all individual dwellings		-
Management 3.3	Annotation: Sub-meters to be provided to all major common area services (list each)		-
Water 3.1	Annotation: Water efficient garden details		-
Energy 3.1	Carpark with natural ventilation or CO monitoring system		-
Energy 4.2	Location and size of solar photovoltaic system		-
Stormwater 1.1	Location of any stormwater management systems (rainwater tanks, raingardens, 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 2.1	Dwellings meeting the requirements for being 'naturally ventilated'		-
Transport 1.2	Location of residential visitor bicycle parking spaces		-
Transport 2.1	Location of electric vehicle charging infrastructure		-
Waste 2.1	Location of food and garden waste facilities		-
Waste 2.2	Location of recycling facilities		-
Urban Ecology 2.1	Location and size of vegetated areas		-

Credit	Requirement	Response	Status
Urban Ecology 2.4	Location of taps and floor waste on balconies / courtyards		-

Supporting evidence

Credit	Requirement	Response	Status
Management 2.2	Preliminary NatHERS assessments		-
Energy 3.1	Details of either the fully natural carpark ventilation or CO monitoring system proposed		-
Energy 3.6	Average lighting power density and lighting type(s) to be used		-
Energy 4.2	Specifications of the solar photovoltaic system(s)		-
Stormwater 1.1	STORM report or MUSIC model		-
IEQ 1.1	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.2	If using an alternative daylight modelling program, a short report detailing assumptions used and results achieved.		-
IEQ 1.5	A list of compliant bedrooms		-
IEQ 2.1	A list of naturally ventilated dwellings		-

Credit summary

Management Overall contribution 4.5%

62%

1.1 Pre-Application Meeting	0%
2.2 Thermal Performance Modelling - Multi-Dwelling Residential	100%
3.1 Metering - 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%	66%	Pass
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	
2.6 Electrification		100%	
3.1 Carpark Ventilation		100%	
3.2 Hot Water		0%	
3.4 Clothes Drying		0%	
3.6 Internal Lighting - Apartments		100%	
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.	

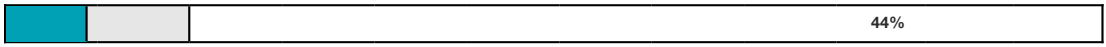
Stormwater Overall contribution 13.5%

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

IEQ Overall contribution 16.5%

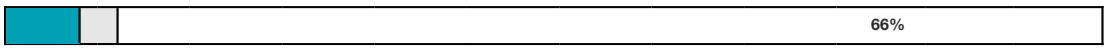
	Minimum required 50%	81%	Pass
1.1 Daylight Access - Living Areas		100%	
1.2 Daylight Access - Bedrooms		100%	
1.3 Winter Sunlight		0%	
1.5 Daylight Access - Minimal Internal Bedrooms		100%	
2.1 Effective Natural Ventilation		66%	

Transport Overall contribution 9.0%



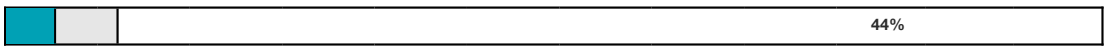
1.1 Bicycle Parking - Residential	0%
1.2 Bicycle Parking - Residential Visitor	100%
1.3 Bicycle Parking - Convenience Residential	0% ⊘ Disabled
	Credit 1.1 must be achieved first.
2.1 Electric Vehicle Infrastructure	100%
2.2 Car Share Scheme	0%
2.3 Motorbikes / Mopeds	0%

Waste Overall contribution 5.5%



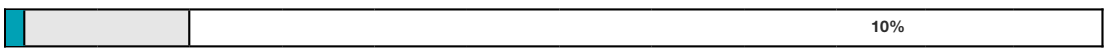
1.1 - Construction Waste - Building Re-Use	0%
2.1 - Operational Waste - Food & Garden Waste	100%
2.2 - Operational Waste - Convenience of Recycling	100%

Urban Ecology Overall contribution 5.5%



1.1 Communal Spaces	0%
2.1 Vegetation	75%
2.2 Green Roofs	0%
2.3 Green Walls and Facades	0%
2.4 Private Open Space - Balcony / Courtyard Ecology	100%
3.1 Food Production - Residential	0%

Innovation Overall contribution 9.0%



1.1 Innovation	10%

Credit breakdown

Management Overall contribution 3%

1.1 Pre-Application Meeting		0%
Score Contribution	This credit contributes 37.5% towards the category score.	
Criteria	Has an ESD professional been engaged to provide sustainability advice from schematic design to construction? AND Has the ESD professional been involved in a pre-application meeting with Council?	
Question	Criteria Achieved ?	
Project	No	

2.2 Thermal Performance Modelling - Multi-Dwelling Residential		100%
Score Contribution	This credit contributes 25% towards the category score.	
Criteria	Have preliminary NatHERS ratings been undertaken for all thermally unique dwellings?	
Question	Criteria Achieved ?	
Apartment	Yes	

3.1 Metering - Residential		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have utility meters been provided for all individual dwellings?	
Question	Criteria Achieved ?	
Apartment	Yes	

3.3 Metering - Common Areas		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Have all major common area services been separately submetered?	
Question	Criteria Achieved ?	
Apartment	Yes	

4.1 Building Users Guide		100%
Score Contribution	This credit contributes 12.5% towards the category score.	
Criteria	Will a building users guide be produced and issued to occupants?	
Question	Criteria Achieved ?	
Project	Yes	

Water Overall contribution 5% Minimum required 50%

Water Approach	
What approach do you want to use for Water?:	Use the built in calculation tools
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
Fixtures, fittings & connections profile	
Showerhead: All	4 Star WELS (>= 6.0 but <= 7.5)
Bath:	
G.01 G.02 G.03 L1.01 L1.02 L1.03 L2.01 L2.02	Medium Sized Contemporary Bath
G.04 L1.04	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?: All	Tank 1
Non-potable water source connected to Toilets: All	Yes
Non-potable water source connected to Laundry (washing machine): All	No
Non-potable water source connected to Hot Water System: All	No
Rainwater tank profile	
What is the total roof area connected to the rainwater tank?: Tank 1	604 m²
Tank Size: Tank 1	15,000 Litres
Irrigation area connected to tank: Tank 1	268 m²
Is connected irrigation area a water efficient garden?: Tank 1	Yes
Other external water demand connected to tank?: Tank 1	-

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	2183 kL
Output	Proposed (excluding rainwater and recycled water use)
Project	1810 kL
Output	Proposed (including rainwater and recycled water use)
Project	1539 kL
Output	% Reduction in Potable Water Consumption
Project	29 %
Output	% of connected demand met by rainwater
Project	88 %
Output	How often does the tank overflow?
Project	Often
Output	Opportunity for additional rainwater connection
Project	767 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 18% Minimum required 50%

Dwellings Energy Approach	
What approach do you want to use for Dwellings?:	Use the built in calculation tools
Are you installing any solar photovoltaic (PV) system(s)?:	Yes
Are you installing any other renewable energy system(s)?:	No
Energy Supply:	All-electric
Dwelling Energy Profiles	
Building: All	Apartment Building
Below the floor is: All	Another Occupancy
Above the ceiling is:	
G.01 G.02 G.03 G.04 L1.01 L1.02 L1.03 L1.04	Another Occupancy
L2.01 L2.02	Outside
Exposed sides:	
G.01 L1.01 L1.02 L2.01 L2.02	3
G.02 G.03 G.04 L1.03 L1.04	2
NatHERS Annual Energy Loads - Heat: All	62.1 MJ/sqm
NatHERS Annual Energy Loads - Cool: All	12.1 MJ/sqm
NatHERS star rating: All	7.0
Type of Heating System: All	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	Electric Instantaneous
Is the hot water system shared by multiple dwellings?: All	Yes
Clothes Line: All	No drying facilities
Clothes Dryer: All	Occupant to Install
Solar Photovoltaic system profile	
System Size (lesser of inverter and panel capacity): Solar	15.0 kW peak
Orientation (which way is the system facing)?: Solar	North

Inclination (angle from horizontal): Solar	10.0 Angle (degrees)	
1.2 Thermal Performance Rating - Residential		50%
Score Contribution	This credit contributes 28.6% towards the category score.	
Criteria	What is the average NatHERS rating?	
Output	Average NATHERS Rating (Weighted)	
Apartment	7.0 Stars	
2.1 Greenhouse Gas Emissions		100%
Score Contribution	This credit contributes 9.5% towards the category score.	
Criteria	What is the % reduction in annual greenhouse gas emissions against the benchmark?	
Output	Reference Building with Reference Services (BCA only)	
Apartment	110,079 kg CO2	
Output	Proposed Building with Proposed Services (Actual Building)	
Apartment	61,693 kg CO2	
Output	% Reduction in GHG Emissions	
Apartment	43 %	
2.2 Peak Demand		0%
Score Contribution	This credit contributes 4.8% towards the category score.	
Criteria	What is the % reduction in the instantaneous (peak-hour) demand against the benchmark?	
Output	Peak Thermal Cooling Load - Baseline	
Apartment	130 kW	
Output	Peak Thermal Cooling Load - Proposed	
Apartment	123 kW	
Output	Peak Thermal Cooling Load - % Reduction	
Apartment	5 %	
2.3 Electricity Consumption		100%
Score Contribution	This credit contributes 9.5% towards the category score.	
Criteria	What is the % reduction in annual electricity consumption against the benchmark?	
Output	Reference	
Apartment	107,920 kWh	
Output	Proposed	
Apartment	60,483 kWh	
Output	Improvement	
Apartment	43 %	
2.4 Gas Consumption		N/A ◈ Scoped Out
This credit was scoped out	No gas connection in use	

2.6 Electrification	100%
Score Contribution	This credit contributes 9.5% towards the category score.
Criteria	Is the development all-electric?
Question	Criteria Achieved?
Project	Yes

3.1 Carpark Ventilation	100%
Score Contribution	This credit contributes 9.5% 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	0%
Score Contribution	This credit contributes 4.8% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) of the hot water system against the benchmark?
Output	Reference
Apartment	150,418 MJ
Output	Proposed
Apartment	141,878 MJ
Output	Improvement
Apartment	5 %

3.4 Clothes Drying	0%
Score Contribution	This credit contributes 4.8% towards the category score.
Criteria	What is the % reduction in annual energy consumption (gas and electricity) from a combination of clothes lines and efficient driers against the benchmark?
Output	Reference
Apartment	6,951 kWh
Output	Proposed
Apartment	6,951 kWh
Output	Improvement
Apartment	0 %

3.6 Internal Lighting - Apartments	100%
Score Contribution	This credit contributes 9.5% towards the category score.
Criteria	Is the maximum illumination power density (W/m2) in at least 90% of the relevant building class at least 20% lower than required by Table J6.2a of the NCC 2019 Vol 1 (Class 2-9)?
Question	Criteria Achieved ?
Apartment	Yes

4.2 Renewable Energy Systems - Solar		100%	
Score Contribution	This credit contributes 4.8% 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	18,178 kWh		
Output	% of Building's Energy		
Apartment	30 %		
4.4 Renewable Energy Systems - Other		0%	⊘ Disabled
This credit is disabled	No other (non-solar PV) renewable energy is in use.		

Stormwater

Overall contribution 14% Minimum required 100%

Which stormwater modelling are you using?:	Melbourne Water STORM tool	
1.1 Stormwater Treatment	100%	
Score Contribution	This credit contributes 100% towards the category score.	
Criteria	Has best practice stormwater management been demonstrated?	
Question	STORM score achieved	
Project	106	
Output	Min STORM Score	
Project	100	

IEQ Overall contribution 14% Minimum required 50%

Use the BESS Deemed to Satisfy (DtS) method for daylight to Dwellings?:	No
What approach do you want to use for daylight to Dwellings?:	Use the built in calculation tools
Room Designation:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) G03 Living G04 Living 103 Living 202 Living	Living
Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all)) G01 Bed 2 G01 Bed 3 G02 Bed 1 G02 Bed 2 G02 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	Bedroom
Quantity:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201)	6
Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	22
G03 Living G04 Living 103 Living 202 Living G01 Bed 2 G01 Bed 3 G02 Bed 1 G02 Bed 2 G02 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	1

Auto-Pass:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	Yes
G03 Living G04 Living 103 Living 202 Living G01 Bed 2 G01 Bed 3 G02 Bed 1 G02 Bed 2 G02 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	No
Room Floor Area:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	-
G03 Living	59.0 m²
G04 Living	49.0 m²
103 Living	48.0 m²
202 Living	65.8 m²
G01 Bed 2	11.9 m²
G01 Bed 3	14.0 m²
G02 Bed 1	15.8 m²
G02 Bed 2	14.6 m²
G02 Bed 3	12.9 m²
G04 Bed 1	10.1 m²
G04 Bed 2 G04 Bed 3	10.5 m²
Vertical Angle:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	-
G03 Living G04 Living	72.8 Angle (degrees)
103 Living	83.8 Angle (degrees)
202 Living	34.0 Angle (degrees)
G01 Bed 2 G01 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	60.5 Angle (degrees)
G02 Bed 1 G02 Bed 2	64.0 Angle (degrees)
G02 Bed 3	54.0 Angle (degrees)

Horizontal Angle:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	-
G03 Living G04 Living	128 Angle (degrees)
103 Living	75.0 Angle (degrees)
202 Living	84.0 Angle (degrees)
G01 Bed 2 G01 Bed 3 G02 Bed 1 G02 Bed 2 G02 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	123 Angle (degrees)
Window Area:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	-
G03 Living G04 Living	17.3 m^2
103 Living	18.4 m^2
202 Living	22.6 m^2
G01 Bed 2 G01 Bed 3 G02 Bed 1 G02 Bed 2 G02 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	3.8 m^2
Window Orientation:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	-
G03 Living G04 Living 103 Living 202 Living	South
G01 Bed 2 G01 Bed 3 G04 Bed 1 G04 Bed 2 G04 Bed 3	East
G02 Bed 1 G02 Bed 2 G02 Bed 3	West

Glass Type:	
Compliant Living Rooms (G01, G02, 101, 102, 104, 201) Compliant Bedrooms (G01 Bed 1, G03 All, 101 - 104 all, 201-202 all))	-
G03 Living G04 Living 103 Living 202 Living G01 Bed 2 G01 Bed 3 G02 Bed 1 G02 Bed 2 G02 Bed 3 G04 Bed 1	Clear Low-E Double (VLT 0.73)
G04 Bed 2 G04 Bed 3	Clear Low-E Single (VLT 0.74)
Daylight Criteria Achieved?: All	Yes

1.1 Daylight Access - Living Areas		100%
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What % of living areas achieve a daylight factor greater than 1%	
Output	Calculated percentage	
Apartment	100 %	

1.2 Daylight Access - Bedrooms		100%
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What % of bedrooms achieve a daylight factor greater than 0.5%	
Output	Calculated percentage	
Apartment	100 %	

1.3 Winter Sunlight		0%
Score Contribution	This credit contributes 9.1% 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	

1.5 Daylight Access - Minimal Internal Bedrooms		100%
Score Contribution	This credit contributes 9.1% 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		66%
Score Contribution	This credit contributes 27.3% towards the category score.	
Criteria	What % of dwellings are effectively naturally ventilated?	
Question	Percentage Achieved?	
Apartment	80 %	

Transport Overall contribution 4%

1.1 Bicycle Parking - Residential		0%
Score Contribution	This credit contributes 22.2% towards the category score.	
Criteria	How many secure and undercover bicycle spaces are there per dwelling for residents?	
Question	Bicycle Spaces Provided ?	
Apartment	9	
Output	Min Bicycle Spaces Required	
Apartment	10	

1.2 Bicycle Parking - Residential Visitor		100%
Score Contribution	This credit contributes 22.2% towards the category score.	
Criteria	How many secure bicycle spaces are there per 5 dwellings for visitors?	
Question	Visitor Bicycle Spaces Provided ?	
Apartment	2	
Output	Min Visitor Bicycle Spaces Required	
Apartment	2	

1.3 Bicycle Parking - Convenience Residential		0%	⊘ Disabled
This credit is disabled	Credit 1.1 must be achieved first.		

2.1 Electric Vehicle Infrastructure		100%
Score Contribution	This credit contributes 22.2% 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 11.1% 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		0%
Score Contribution	This credit contributes 11.1% 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)?	
Question	Criteria Achieved ?	
Project	No	

Waste Overall contribution 4%

1.1 - Construction Waste - Building Re-Use	0%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	If the development is on a site that has been previously developed, has at least 30% of the existing building been re-used?
Question	Criteria Achieved ?
Project	No

2.1 - Operational Waste - Food & Garden Waste	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are facilities provided for on-site management of food and garden waste?
Question	Criteria Achieved ?
Project	Yes

2.2 - Operational Waste - Convenience of Recycling	100%
Score Contribution	This credit contributes 33.3% towards the category score.
Criteria	Are the recycling facilities at least as convenient for occupants as facilities for general waste?
Question	Criteria Achieved ?
Project	Yes

Urban Ecology Overall contribution 2%

1.1 Communal Spaces		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there at least the following amount of common space measured in square meters : * 1m² for each of the first 50 occupants * Additional 0.5m² for each occupant between 51 and 250 * Additional 0.25m² for each occupant above 251?	
Question	Common space provided	
Apartment	0.0 m²	
Output	Minimum Common Space Required	
Apartment	31 m²	
2.1 Vegetation		75%
Score Contribution	This credit contributes 44.4% 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	21 %	
2.2 Green Roofs		0%
Score Contribution	This credit contributes 11.1% 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 11.1% 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		100%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	Is there a tap and floor waste on every balcony and courtyard (including any roof terraces)?	
Question	Criteria Achieved ?	
Apartment	Yes	
3.1 Food Production - Residential		0%
Score Contribution	This credit contributes 11.1% towards the category score.	
Criteria	What area of space per resident is dedicated to food production?	
Question	Food Production Area	
Apartment	0.0 m²	
Output	Min Food Production Area	
Apartment	8 m²	

Innovation Overall contribution 1%

Innovation	
Description: Smart metering	Smart metering for electricity and water will be provided to all apartments and interface will be provided for the EV charging units.
Points Targeted: Smart metering	1

1.1 Innovation		10%
Score Contribution	This credit contributes 100% towards the category score.	
Criteria	What percentage of the Innovation points have been claimed (10 points maximum)?	

Disclaimer

ESD MEMO

To:	Ms. Shi Yang	Date:	11/10/2024
Organisation:	City of Banyule	Project Number:	GIW22227
Project:	3 Waverly Ave, Ivanhoe	Subject:	RFI Response Updated As per Amended Drawing Set dated 9/10/2024
Planning Application Number:	P635/2023		

Introduction

GIW has undertaken a review of the RFI comments provided by Banyule Council received as at 03/08/2023 and have provided responses in the table below.

Sources of Information

The ESD Memo is based on the following documentation:

- City of Banyule – Request for Further Information (dated: 03/08/2023).
- Sustainable Management Plan Rev D (dated: 06/09/2023) prepared by GIW Environmental Solutions.
- KUD – Project No. 22-022 – Drawing No. Drawing No. TP002 Rev A; TP100 Rev A, TP200 Rev A; TP300-TP304 Rev A; TP306-TP308 Rev A; TP400-TP402 Rev B; TP500-TP501 Rev A; TP600-TP603 Rev A; TP650-TP652 Rev A; TP660-TP665 Rev A, TP700-TP706 Rev A.

RFI Response

Council RFI	GIW Response
Provide preliminary NatHERS certificates for all apartments showing an average star rating of 7.0	All apartments have been assessed as preliminary town planning FirstRate5 assessments. Please refer updated SMP for results; no apartment exceeds the maximum cooling load of 21MJ/m2 and an average of 7 stars is achieved.
Prior to occupation, provide a copy of the Building Users Guide outlining the sustainability features within the development and avenues for behaviour change (i.e. waste management);	The building users guide is to be prepared by the builder prior to practical completion.
Amend the planting schedules within the Landscape Plan to identify what species are locally indigenous, native, or exotic – and provide more details around type of mulching (avoiding black mulch) and irrigation system (whether sub-surface drip irrigation or none proposed after establishment)	Refer to responses by Landscape Architect - Jack Merlo as per previous ESD Memo dated 20/10/2023.
Clarify maximum cooling loads, as the SMP states that they will be less than 21MJ/sqm, however the table shows that apartment G.02 has a cooling load of 25.6MJ/sqm (SMP, p. 11)	Refer the Energy Section within the SMP Rev G (refer page 11).
Amend the plans to show the approximate location of Co sensors in the basement car park	KUD have included the following note on the drawings: "CO sensors connected to the exhaust fans are to be provided".
Amend the claim around heating and cooling systems to include 'or CoP & EER not less than 85% of the of the most efficient equivalent capacity unit available'	GIW have included this requirement within the SMP Rev G (refer page 13).
Confirm that post-development stormwater flows will not exceed pre-development levels	Item is to be conditioned.
Clarify whether any additional filtration or treatment of stormwater is required prior to reuse	As rainwater is only collected off non-trafficable areas no additional filtration (other than standard practice) is required.
Amend the plans to identify bedroom numbers (i.e. B1, B2, B3), and ensure all bedrooms are included within the Daylight Room Profile (i.e. there appears to only be two bedrooms for G.01)	KUD has updated drawings accordingly. All bedrooms are included in the BESS DTS daylight assessment.

Provide breeze path diagrams for each apartment (in line with the BESS tool notes for IEQ 2.2) within the ESD Drawing/s	GIW have included Appendix D – Breeze Paths within the SMP detailing the breeze path diagrams.
Clarify the approach to reducing VOC and formaldehyde in building materials and products	GIW have outlined that the VOC and formaldehyde content in building materials and products is to be in line with Green Star Buildings V1 Credit 13. Refer Page 18 of SMP Rev G.
Confirm whether the EV charging claims just include the pre-wiring, or are the physical EVSE/chargers	1 x EV charging station will be provided to G.01, the remaining 9 apartments will have pre-wiring for their own future stations.
Confirm that cabling and GPOs associated with EV infrastructure support level 2 (mode 3) 7kW 32Amp EV charging.	The SMP includes a note that "All pre-wiring cabling and GPOs for EV chargers will support level 2 (mode 3) 7Kw 32Amp EV charging." Refer Page 19 of SMP Rev G.
Provide an operational Waste Management Plan	Waste Management Consultant to prepare WMP.
Clarify whether under-bench cabinets will feature waste separation for multiple streams (i.e. general, commingled and glass recycling bins);	It will be investigated if this can be provided. At a minimum general and recycling bins will be provided within the kitchen area.
Provide details within the WMP regarding the storage in apartments and pick up of FOGO	Waste management consultant to include in WMP.
Amend the plans and WSUD Drawing to clearly show the location of the tap and floor waste	KUD has depicted taps and floor wastes to all POS.
Amend the material schedule to include specification of roofing and unshaded hard landscaping features to meet the SRI values outlined in the SMP	KUD has added the following notes to the drawings: • Roof material to have a three-year SRI of minimum 60. • Unshaded hard-scaping elements to have a three-year SRI of minimum 40.
Clarify any firm commitments around the use of recycled materials (i.e. bricks) or products with post-consumer content (i.e. bulk insulation);	No recycled materials or post-consumer content products will be used within the development.
Include a percentage target for the reduction of Portland cement within the embodied carbon commitments	The following commitment has been added to the SMP (under materials): Concrete elements will have a 30% Portland Cement reduction where approved by the structural engineer. Refer Page 21 of SMP Rev G.
Council recommends that developments are all-electric (no natural gas) and all systems and equipment to be altered accordingly. Please speak to Council about the short and long-term benefits of electric only developments and how	GIW included clarification within the SMP to outline that the development will be all-electric with no gas connection to site. Refer Page 13 of SMP Rev G.

we can facilitate this through the planning process.	
All developments are provided with rainwater tank connections to toilets, and laundries within the nominated STORM Report as an extra individual room. This can avoid the requirements for Raingardens and other SQID Systems which are not supported by Council.	No raingarden or SQID systems are proposed. This comment is deemed not applicable.
ESD Improvement Opportunities (Optional)	
Strongly recommend electric heat pumps are used as instantaneous electric systems are more applicable for smaller apartments (2< bedrooms) or industrial used where hot water demand is low;	As per the services consultant and system provider, this item will not be pursued.
Consider smart metering or an interface residents can access to control their energy and water usage;	GIW have included this as an innovation point: smart metering and interface will be provided for the EV charging units.
Consider 6-star WELS taps to further increase the water efficiency and reduce potable water consumption;	This item will not be pursued.
Consider reconfiguring the basement carpark to include a single secure bicycle parking space per apartment or moped/motorbike parking;	9 off. bicycle spaces have been provided within the basement for communal use. Mopeds and electric scooters can be considered as dangerous and are not recommended for the age group of the potential residence.
Recommend this is increased to 90% to align with industry best practice;	This item will not be pursued.
Consider increasing the integrated planter boxes along the full length of the balconies;	This item will not be pursued.
Consider materials and construction methods to assist with disassembly and adaptive reuse;	This item will not be pursued.