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Thermal Comfort & BASIX Assessment

Proposed Dwelling: Freshwater House at 31 Koolara Avenue, Freshwater NSW 2096

Job No.	Revision	Notes	Date
Hsu & Hudson	A	NatHERS & BASIX Assessment	22/12/2023

Thermal Comfort Specifications	
Glazing: Doors/windows	'Default' codes modelled which are not brand specific. You can use any brand/manufacturer and type of glass and frame; these are maximum U-values, and there is a flexibility of +/- 10% (as stated below) with the SHGC value. Group A – bifold and casement doors: PVC-005-01: U-Value: 2.60 (equal to or lower than) SHGC: 0.50 (±10%) Group B – sliding doors/windows + fixed glazing: PVC-006-01: U-Value: 2.60 (equal to or lower than) SHGC: 0.53 (±10%) Given values are AFRC, total window system values (glass and frame)
Skylights	Double glazed with timber or aluminium frame
Roof	Concrete roof with waterproof membrane Colour: Light (0.475>SA)
Ceiling	Plasterboard ceiling with R4.0 insulation (insulation only value) where roof above No insulation required to Garage ceiling Ground Floor ceiling is concrete between levels
Ceiling penetrations	Sealed LED downlights to Ground Floor, modelled; One per 3m^2
External Walls	Concrete with R2.7 insulation (insulation only value) No insulation required to Garage walls Default Medium colour modelled (0.475<SA<0.7)
Internal walls	Plasterboard on studs *Note: tested also with single skin masonry which performs 0.1 Stars better. Have applied worst case scenario with plasterboard on studs. Single skin masonry can be installed as an alternative.*
Floors	Concrete slab on ground with R1.8 underslab insulation (insulation only value Concrete to First Floor (between levels) with R2.0 insulation (insulation only value) to any suspended floor with open subfloor Floor coverings: Tiles to Ground Floor and the wet areas of First Floor, carpet to upstairs bedrooms, timber elsewhere upstairs
Ceiling fans	Three Ceiling Fans: one to Upper Sitting Room, one to Dining Room, and one to either the GF Sitting Room or Living Room
External Shading	Covered Alfresco and Balconies. Shading screens to Ensuite 1 and Study windows. Eaves as shown on drawings
BASIX Water Commitments	
Fixtures	Install showerheads minimum rating of 4 stars (>6.0 and <= 7.5 Litres/min) Install toilet flushing system with a minimum rating of 4 stars in each toilet Install tap with minimum rating of 4 stars in the kitchen Install taps with minimum rating of 4 stars in each bathroom
Alternative Water	Install rainwater tank with minimum 10,000L capacity, connected to – At least one outdoor tap and toilets, and used to top up spa and pool Rainwater harvest collected from a min. 215m^2 roof area
Pool and Spa	Volume of Pool: 74kL, Volume of Spa: 6kL. Both Pool and Spa are to have a cover.
BASIX Energy Commitments	
Hot water System	Gas Instantaneous with minimum performance of 6 Stars
Cooling system	3 phase air conditioning to living areas and bedrooms: EER 3.0-3.5
Heating system	3 phase air conditioning to living areas and bedrooms: EER 3.0-3.5
Ventilation	Kitchen - Individual fan, externally ducted to roof or façade, manual on/off switch Bathrooms - Individual fan, externally ducted to roof or façade, manual on/off switch Laundry - Individual fan, externally ducted to roof or façade, manual on/off switch
Pool and Spa	Pool Heating System: solar (electric boosted), controlled by timer, dual speed pool pump with minimum performance of 6 Stars. Spa Heating System: solar (electric boosted), controlled by timer
Alternative Energy	Minimum 5.5kW of solar/PV, with panels sloped between >0^o to <=10^o,and facing North West
Other	Gas cooktop & electric oven Outdoor clothes drying line

Nationwide House Energy Rating Scheme®
NatHERS® Certificate No. 0009167644-02

Generated on 22 Dec 2023 using BERS Pro v5.1.7 (3.22)

Property

Address	31 Kooloora Avenue, FRESHWATER , NSW , 2096
Lot/DP	Lot 22 DP 7022
NCC class*	1a
Floor/all Floors	G of 2 floors
Type	New Home

Plans

Main plan	Hsu and Hudson
Prepared by	R Squared Studios Pty Ltd

Construction and environment

Assessed floor area [m2]*	
Conditioned*	243.1
Unconditioned*	6.3
Total	265.9
Garage	16.5

Exposure type
Open

NatHERS climate zone
56 Mascot (Sydney Airport)

Accredited assessor

Name	Danielle Grumont
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Accreditation No.	HERA10134
Assessor Accrediting Organisation	HERA
Declaration of interest	Declaration completed: no conflicts

NCC Requirements

NCC provisions	Volume Two
Strate/Territory variation	Yes

National Construction Code (NCC) requirements

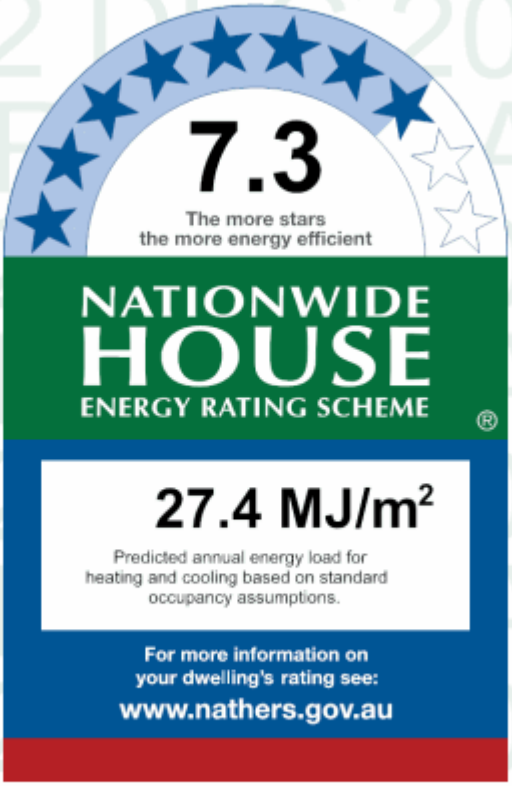
The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Thermal performance Star rating



Thermal performance [MJ/m²]

Limits taken from ABCB Standard 2022

	Heating	Cooling
Modelled	16.1	11.2
Load limits	N/A	N/A

Features determining load limits

Floor Type (lowest conditioned area)	SF
NCC climate zone 1 or 2	No
Outdoor living area	No
Outdoor living area ceiling fan	No

Whole of Home performance rating

No Whole of Home performance rating generated for this certificate.

Verification

To verify this certificate, scan the QR code or visit hstar.com.au/QR/Generate?p=KsaEMySxs . When using either link, ensure you are visiting hstar.com.au

* Refer to glossary

About the ratings

Thermal performance rating

NatHERS thermal software models the expected heating and cooling energy loads using information about the design, construction, climate and common patterns of household use. The thermal performance rating (shown as a star rating on this Certificate) does not take into account appliances, apart from the airflow impacts from ceiling fans.

Whole of Home performance rating

NatHERS Whole of Home software uses the heating and cooling energy loads combined with the energy performance of the home's appliances (heating, cooling, hot water, lighting, pool/spa pump and onsite renewable energy generation and storage) and models the expected energy value* of the whole home. The Whole of Home performance rating is shown as a score out of 100 on this Certificate.

Heating & Cooling Load Limits

Additional information

In some locations under the NCC NatHERS pathway, separate heating and cooling load limits may apply. Minimum required star ratings in northern parts of Australia may also be affected by the presence or absence of an outdoor living area and/or an outdoor living area ceiling fan. Refer to the *ABCB Standard 2022: NatHERS heating and cooling load limits* for details or contact the relevant local building regulating authority, noting that State and Territory variations may also apply.

Setting Options:

Floor Type:

CSOG – Concrete Slab on Ground
SF – Suspended Floor (or a mixture of CSOG and SF)
NA – Not Applicable

NCC Climate Zone 1 or 2:

Yes
No
NA – Not Applicable

Outdoor Living Area:

Yes
No
NA – Not Applicable

Outdoor Living Area Ceiling Fan:

Yes
No
NA – Not Applicable

Predicted onsite renewable energy impact

No Whole of Home performance assessment conducted for this certificate.

Predicted Whole of Home annual impact by appliance

Energy use

No Whole of Home performance assessment conducted for this certificate

Greenhouse gas emissions

No Whole of Home performance assessment conducted for this certificate

Cost

No Whole of Home performance assessment conducted for this certificate

* Refer to glossary.

Certificate check

The checklist covers important items impacting the dwelling's ratings. It is recommended that the accuracy of the whole certificate is checked.

Note: The boxes indicate when and by whom each item should be checked. It is not mandatory to complete this checklist.

	Approval Stage		Construction Stage		
	Assessor checked	Consent Authority/ Surveyor checked	Builder checked	Consent Authority Surveyor checked	Occupancy/Other
Genuine certificate check					
Does this Certificate match the one available at the web address or QR code verification link on the front page?		☐	☐	☐	☐
Does the NatHERS certificate number on the NatHERS-stamped plans match the number on this Certificate?		☐	☐	☐	☐
Thermal performance check					
Windows and glazed doors					
Does the window size, opening type and location shown on the NatHERS-stamped plans or as installed match what is shown in 'Window and glazed door schedule' and 'Roof window schedule' tables on this Certificate?	☐	☐	☐	☐	☐
Does the installed windows meet the substitution tolerances (AFRC* based SHGC* and U-values*) as shown in the 'Window and glazed door type and performance' and 'Roof window type and performance' tables on this Certificate?			☐	☐	☐
External walls					
Does the external wall bulk insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the External wall type table on this Certificate?	☐	☐	☐	☐	☐
Does the external wall shade (colour) match what is shown in the 'External wall type' table on this Certificate?	☐	☐	☐	☐	☐
Floor					
Does the floor insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the 'Floor type' table on this certificate?	☐	☐	☐	☐	☐
Ceiling penetrations*					
Does the 'quantity' and 'type' of ceiling penetrations* (e.g. downlights, exhaust fans, etc) shown on the NatHERS-stamped plans or as installed match what is shown in the 'Ceiling penetrations' table on this Certificate?	☐	☐	☐	☐	☐
Ceiling					
Does the ceiling insulation (R-value) shown on the NatHERS-stamped plans or as installed match what is shown in the 'Ceiling type' table on this Certificate?	☐	☐	☐	☐	☐
Roof					
Does the external roof shade (colour) on the NatHERS stamped plans or as installed match what is shown in the 'Roof type' table on this Certificate?	☐	☐	☐	☐	☐
Apartment entrance doors (NCC Class 2 assessments only)					
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 type (terrain) (shown on page 1) been applied? For example, it is unlikely that a ground-floor apartment is "exposed" or a top floor high-rise apartment is "protected".	☐	☐		☐	☐
Heating and cooling load limits*					
Do the load limits settings (shown on page 1) match what is shown	☐	☐	☐	☐	☐

* Refer to glossary.

Certificate check

Continued

	Approval Stage		Construction Stage		
	Assessor checked	Consent Authority/ Surveyor checked	Builder checked	Consent Authority Surveyor checked	Occupancy/Other
Additional NCC requirements for thermal performance (not included in the NatHERS assessment)					
Thermal bridging					
Does the dwelling meet the NCC requirement for thermal bridging?		☐	☐	☐	☐
Insulation installation method					
Has the insulation been installed according to the NCC requirements?			☐	☐	☐
Building sealing					
Does the dwelling meet the NCC requirements for Building Sealing?		☐	☐	☐	☐
Whole of Home performance check (not applicable if a Whole of Home performance assessment is not conducted)					
Appliances					
Does the cooling appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the Appliance schedule on this Certificate?	☐	☐	☐	☐	☐
Does the heating appliance/s type, location and efficiency/performance shown on the NatHERS-stamped plans or installed, match the location and minimum efficiency/performance requirements shown in the 'Appliance schedule' on this Certificate?	☐	☐	☐	☐	☐
Does the hot water system type and efficiency/performance shown on the NatHERS-stamped plans or as installed match the location and minimum efficiency/performance requirements shown in the 'Appliance schedule' on this Certificate?	☐	☐	☐	☐	☐
Does the pool pump efficiency/performance shown on the NatHERS-stamped plans or as installed match the minimum efficiency/performance requirements shown in the 'Appliance schedule' on this Certificate?	☐	☐	☐	☐	☐
Does the onsite renewable energy system type, orientation and system size or generation capacity shown on the NatHERS stamped plans or installed match the 'Onsite Renewable Energy schedule' on this Certificate?	☐	☐	☐	☐	☐
Additional NCC Requirements for Services (not included in the NatHERS assessment)					
Does the lighting meet the artificial lighting requirements specified in the NCC?		☐	☐	☐	☐
Does the hot water system meet the additional requirements specified in the NCC?		☐	☐	☐	☐
Provisional values* check					
Have provisional values* been used in the assessment and, if so, are they noted in 'Additional notes' table below?	☐	☐			

Other NCC requirements

Note: This Certificate only covers the energy efficiency requirements in the NCC. Additional requirements that must also be satisfied include, but are not limited to: condensation, structural and fire safety requirements and any state or territory variations to the NCC energy efficiency requirements.

Additional notes

One sealed LED Downlight modelled per 3m2

Sealed exhaust fans to wet areas

Modelled with internal plasterboard walls. Note that I have tested the model with single skin brick internal walls and

* Refer to glossary.

it achieves a higher star rating than with worst case scenario plasterboard (0.1 stars higher).

Default window values applied; these are max. U-values, and flexibility of +/-10% with SHGC.

Room *schedule*

Room	Zone Type	Area [m^2]
Garage	Garage	16.5
Media Room	Living	12.75
Laundry	Unconditioned	6.34
WIP	Daytime	4.09
Kitchen/Dining	Kitchen/Living	29.43
Sit/Liv/Entry	Living	54.3
Powder Room	Daytime	3.4
Office	Daytime	8.44
WIR	Nighttime	9.49
Ensuite 2	Nighttime	8.04
Master Bedroom	Bedroom	18.26
Bedroom 1	Bedroom	14.88
Ensuite 1	Daytime	8.39
Study	Daytime	8.44
Bedroom 2	Bedroom	14.36
Bedroom 3	Bedroom	13.72
Sitting Rm/Hall	Daytime	38.09
Void	Unconditioned	3.92

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
PVC-005-01 W	uPVC A DG Argon Fill Clear-Clear	2.6	0.50	0.48	0.53
PVC-006-01 W	uPVC B DG Argon Fill Clear-Clear	2.6	0.53	0.50	0.56

* Refer to glossary.

Custom windows*

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

Window and glazed door *schedule*

Location	Window ID	Window no.	Height [mm]	Width [mm]	Window type	Opening %	Orientation	Window shading device*
Media Room	PVC-005-01 W	GD03	3000	2200	Bifold	90	SE	No
WIP	PVC-006-01 W	GW06	3000	550	Fixed	00	NE	No
Kitchen/Dining	PVC-006-01 W	GW05	3000	4500	Fixed	00	SE	No
Kitchen/Dining	PVC-006-01 W	GD02	3000	3000	Sliding	60	SW	No
Sit/Liv/Entry	PVC-006-01 W	GW08	3000	4300	Fixed	00	NW	No
Sit/Liv/Entry	PVC-006-01 W	GD01	550	1100	Fixed	00	NE	No
Sit/Liv/Entry	PVC-006-01 W	GW02	3000	2200	Fixed	00	NE	No
Sit/Liv/Entry	PVC-006-01 W	GW03	3000	3600	Fixed	00	SE	No
Sit/Liv/Entry	PVC-006-01 W	GW04 GF	3000	3785	Fixed	00	SE	No
Powder Room	PVC-006-01 W	GW07	3000	550	Fixed	00	SW	No
Office	PVC-006-01 W	GW01	2900	900	Fixed	00	NE	No
Ensuite 2	PVC-006-01 W	1W01	1750	1510	Fixed	00	NE	No
Master Bedroom	PVC-006-01 W	1D01	2700	2710	Sliding	60	NE	Yes
Master Bedroom	PVC-006-01 W	1D02	2700	3600	Sliding	60	SE	Yes
Bedroom 1	PVC-005-01 W	1D05	2700	1240	Casement	90	SE	No
Bedroom 1	PVC-006-01 W	1W06	2700	945	Fixed	00	SW	No
Ensuite 1	PVC-006-01 W	1W02	2100	900	Fixed	00	NW	Yes
Ensuite 1	PVC-006-01 W	1W03	2100	900	Fixed	00	NW	Yes
Study	PVC-006-01 W	1W04	2100	1000	Fixed	00	NW	Yes
Study	PVC-006-01 W	1W05	2100	1000	Fixed	00	NE	No
Bedroom 2	PVC-006-01 W	1D04	2700	2600	Sliding	60	SE	Yes
Bedroom 3	PVC-006-01 W	1D03	2300	2600	Sliding	30	SE	Yes
Void	PVC-006-01 W	GW04 FF	4255	3785	Fixed	00	SE	No

* Refer to glossary.

Roof window* *type and performance value*

Default roof windows*

Window ID	Window Description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
DG-Generic-02 A	DG-Generic-02 A Clear Al DG DEFAULT ROOF WINDOW System 02	4.2	0.72	0.68	1.40

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 %	Height [mm]	Width [mm]	Orientation	Outdoor shade	Indoor shade
WIR	DG-Generic-02 A	SK02	0	1100	700	NW	Yes	Yes
Ensuite 2	DG-Generic-02 A	SK03	0	660	1600	NW	Yes	Yes

Skylight* *type and performance*

Skylight ID	Skylight description	Skylight shaft reflectance
GEN-04-008a	Double-glazed clear, Timber and Aluminium Frame	0.5

Skylight* *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length [mm]	Area [m^2]	Orientation	Outdoor shade	Diffuser
Sitting Rm/Hall	GEN-04-008a	SK01	200	3.07	NW	None	No

External door *schedule*

Location	Height [mm]	Width [mm]	Opening %	Orientation
Garage	2300	2800	90	NE
Garage	2250	2700	90	SE
Laundry	2400	800	90	NW
Sit/Liv/Entry	2400	1100	90	NE

* Refer to glossary.

External wall *type*

Wall ID	Wall type	Solar absorptance	Wall shade [colour]	Bulk insulation [R-value]	Reflective wall wrap*
EW-1	Tilt up Concrete	0.496489411764706		No insulation	No
EW-2	Tilt up Concrete	0.496489411764706		Bulk Insulation R2.7	No

External wall *schedule*

Location	Wall ID	Height [mm]	Width [mm]	Orientation	Horizontal shading feature* maximum projection [mm]	Vertical shading feature [yes/no]
Garage	EW-1	2300	3000	NW	50	No
Garage	EW-1	2300	5500	NE	0	No
Garage	EW-1	2300	3000	SE	2225	No
Garage	EW-1	2300	5500	SW	50	No
Media Room	EW-2	3000	3645	NW	0	No
Media Room	EW-2	3000	2700	SE	4675	No
Media Room	EW-2	3000	3600	SW	5750	No
Laundry	EW-2	3000	3340	NW	0	No
WIP	EW-2	3000	1895	NW	0	No
WIP	EW-2	3000	1550	NE	4850	No
Kitchen/Dining	EW-2	3000	6195	SE	850	No
Kitchen/Dining	EW-2	3000	3595	SW	8450	No
Sit/Liv/Entry	EW-2	3000	4845	NW	0	No
Sit/Liv/Entry	EW-2	3000	445	SW	4850	No
Sit/Liv/Entry	EW-2	3000	1495	NE	3550	No
Sit/Liv/Entry	EW-2	3000	2250	NW	3900	No
Sit/Liv/Entry	EW-2	3000	3300	NE	2000	No
Sit/Liv/Entry	EW-2	3000	5450	SE	1225	No
Sit/Liv/Entry	EW-2	3000	1000	NE	6900	No
Sit/Liv/Entry	EW-2	3000	4400	SE	300	No
Sit/Liv/Entry	EW-2	3000	1000	SW	12350	No
Sit/Liv/Entry	EW-2	3000	245	SE	1300	No
Powder Room	EW-2	3000	1095	SW	4850	No
Powder Room	EW-2	3000	1595	NW	0	No

* Refer to glossary.

Location	Wall ID	Height [mm]	Width [mm]	Orientation	Horizontal shading feature* maximum projection [mm]	Vertical shading feature [yes/no]
Office	EW-2	3000	3645	NW	0	No
Office	EW-2	3000	2000	NE	675	No
Office	EW-2	3000	292	E	1513	No
Office	EW-2	3000	381	SE	5308	No
Office	EW-2	3000	1750	SE	6275	No
WIR	EW-2	2700	1550	SW	17300	No
WIR	EW-2	2700	2845	NW	900	No
Ensuite 2	EW-2	2700	2395	NW	900	No
Ensuite 2	EW-2	2700	3545	NE	3450	No
Master Bedroom	EW-2	2700	3645	NE	3450	No
Master Bedroom	EW-2	2700	5245	SE	1000	No
Bedroom 1	EW-2	2700	4295	NW	900	No
Bedroom 1	EW-2	2700	1600	SE	4600	No
Bedroom 1	EW-2	2700	3600	SW	975	No
Ensuite 1	EW-2	2700	3590	NW	900	No
Study	EW-2	2700	3545	NW	900	No
Study	EW-2	2700	1550	NE	13550	No
Bedroom 2	EW-2	2700	4195	SE	1000	No
Bedroom 2	EW-2	2700	3595	SW	2525	No
Bedroom 3	EW-2	2700	4140	SE	1000	No
Sitting Rm/Hall	EW-2	2700	4840	NW	950	No
Sitting Rm/Hall	EW-2	2700	195	SE	1000	No
Sitting Rm/Hall	EW-2	2700	1745	SE	1000	No
Void	EW-2	4255	995	NE	8525	No
Void	EW-2	4255	4400	SE	0	No
Void	EW-2	4255	995	SW	12425	No

Internal wall *type*

Wall ID	Wall type	Area [m^2]	Bulk insulation
IW-001	Timber Stud Frame, Direct Fix Plasterboard	195.12	No insulation

* Refer to glossary.

Floor *type*

Location	Construction	Area [m^2]	Sub-floor ventilation	Added insulation [R-value]	Covering
Garage	Concrete Slab on Ground 200mm	16.50	None	No Insulation	Bare
Media Room	Concrete Slab on Ground 200mm	12.75	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
Laundry	Concrete Slab on Ground 200mm	6.34	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
WIP	Concrete Slab on Ground 200mm	4.09	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
Kitchen/Dining	Concrete Slab on Ground 200mm	29.43	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
Sit/Liv/Entry	Concrete Slab on Ground 200mm	54.30	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
Powder Room	Concrete Slab on Ground 200mm	3.40	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
Office	Concrete Slab on Ground 200mm	8.44	None	Bulk Insulation in Contact with Floor R1.8	Ceramic Tiles 8mm
WIR / Sit/Liv/Entry	Concrete Timber Framed Above Plasterboard 200mm	4.67		No Insulation	Carpet+Rubber Underlay 18mm
WIR / Powder Room	Concrete Timber Framed Above Plasterboard 200mm	2.82		No Insulation	Carpet+Rubber Underlay 18mm
WIR / Office	Concrete Timber Framed Above Plasterboard 200mm	3.19		No Insulation	Carpet+Rubber Underlay 18mm
Ensuite 2 / Office	Concrete Timber Framed Above Plasterboard 200mm	5.34		No Insulation	Ceramic Tiles 8mm

Location	Construction	Area [m^2]	Sub-floor ventilation	Added insulation [R-value]	Covering
Ensuite 2	Suspended Concrete Slab 200mm	2.68	Totally Open	Bulk Insulation in Contact with Floor R2	Ceramic Tiles 8mm
Master Bedroom / Sit/Liv/Entry	Concrete Timber Framed Above Plasterboard 200mm	17.47		No Insulation	Carpet+Rubber Underlay 18mm
Master Bedroom	Suspended Concrete Slab 200mm	18.30	Totally Open	Bulk Insulation in Contact with Floor R2	Carpet+Rubber Underlay 18mm
Bedroom 1 / Media Room	Concrete Timber Framed Above Plasterboard 200mm	5.85		No Insulation	Carpet+Rubber Underlay 18mm
Bedroom 1	Suspended Concrete Slab 200mm	8.65	Totally Open	Bulk Insulation in Contact with Floor R2	Carpet+Rubber Underlay 18mm
Ensuite 1 / Media Room	Concrete Timber Framed Above Plasterboard 200mm	4.48		No Insulation	Ceramic Tiles 8mm
Ensuite 1 / Laundry	Concrete Timber Framed Above Plasterboard 200mm	3.43		No Insulation	Ceramic Tiles 8mm
Ensuite 1 / Kitchen/Dining	Concrete Timber Framed Above Plasterboard 200mm	7.83		No Insulation	Ceramic Tiles 8mm
Study / Laundry	Concrete Timber Framed Above Plasterboard 200mm	3.48		No Insulation	Cork Tiles or Parquetry 8mm
Study / WIP	Concrete Timber Framed Above Plasterboard 200mm	3.85		No Insulation	Cork Tiles or Parquetry 8mm
Study / Kitchen/Dining	Concrete Timber Framed Above Plasterboard 200mm	2.75		No Insulation	Cork Tiles or Parquetry 8mm
Bedroom 2 / Kitchen/Dining	Concrete Timber Framed Above Plasterboard 200mm	2.36		No Insulation	Carpet+Rubber Underlay 18mm
Bedroom 2	Suspended Concrete Slab 200mm	12.39	Totally Open	Bulk Insulation in Contact with Floor R2	Carpet+Rubber Underlay 18mm
Bedroom 3 / Kitchen/Dining	Concrete Timber Framed Above Plasterboard 200mm	13.72		No Insulation	Carpet+Rubber Underlay 18mm
Sitting Rm/Hall / Media Room	Concrete Timber Framed Above Plasterboard 200mm	0.00		No Insulation	Cork Tiles or Parquetry 8mm
Sitting Rm/Hall / Kitchen/Dining	Concrete Timber Framed Above Plasterboard 200mm	6.60		No Insulation	Cork Tiles or Parquetry 8mm
Sitting Rm/Hall / Sit/Liv/Entry	Concrete Timber Framed Above Plasterboard 200mm	21.63		No Insulation	Cork Tiles or Parquetry 8mm
Void / Sit/Liv/Entry	Concrete Timber Framed Above Plasterboard 200mm	1.04		No Insulation	Carpet 10mm

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap* [yes/no]
Garage	Concrete, Plasterboard with Timber Frame	No insulation	
Media Room	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Media Room	Concrete Timber Framed Above Plasterboard	No Insulation	
Laundry	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Laundry	Concrete Timber Framed Above Plasterboard	No Insulation	
WIP	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
WIP	Concrete Timber Framed Above Plasterboard	No Insulation	
Kitchen/Dining	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Kitchen/Dining	Concrete Timber Framed Above Plasterboard	No Insulation	
Sit/Liv/Entry	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Sit/Liv/Entry	Concrete Timber Framed Above Plasterboard	No Insulation	
Powder Room	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Powder Room	Concrete Timber Framed Above Plasterboard	No Insulation	
Office	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Office	Concrete Timber Framed Above Plasterboard	No Insulation	
WIR	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Ensuite 2	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Master Bedroom	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Bedroom 1	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Ensuite 1	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Study	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Bedroom 2	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Bedroom 3	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Sitting Rm/Hall	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	
Void	Concrete, Plasterboard with Timber Frame	Bulk Insulation R4	

Ceiling *penetrations**

Location	Quantity	Type	Diameter [mm]	Sealed/unsealed
Media Room	4	Downlights - LED	150	Sealed
Laundry	2	Downlights - LED	150	Sealed

* Refer to glossary.

Location	Quantity	Type	Diameter [mm]	Sealed/unsealed
Laundry	1	Exhaust Fans	300	Sealed
WIP	1	Downlights - LED	150	Sealed
Kitchen/Dining	10	Downlights - LED	150	Sealed
Kitchen/Dining	1	Exhaust Fans	300	Sealed
Sit/Liv/Entry	18	Downlights - LED	150	Sealed
Powder Room	1	Downlights - LED	150	Sealed
Powder Room	1	Exhaust Fans	300	Sealed
Office	3	Downlights - LED	150	Sealed
WIR	3	Downlights - LED	150	Sealed
Ensuite 2	3	Downlights - LED	150	Sealed
Ensuite 2	1	Exhaust Fans	300	Sealed
Master Bedroom	5	Downlights - LED	150	Sealed
Bedroom 1	5	Downlights - LED	150	Sealed
Ensuite 1	3	Downlights - LED	150	Sealed
Study	2	Downlights - LED	150	Sealed
Bedroom 2	5	Downlights - LED	150	Sealed
Bedroom 3	4	Downlights - LED	150	Sealed
Sitting Rm/Hall	13	Downlights - LED	150	Sealed

Ceiling *fans*

Location	Quantity	Diameter [mm]
Kitchen/Dining	1	1200
Sit/Liv/Entry	1	1200
Sitting Rm/Hall	1	1200

Roof *type*

Construction	Added insulation [R-value]	Solar absorptance	Roof shade[colour]
Waterproofing Membrane	No Added Insulation, No air Gap	0.3	Light

Thermal bridging *schedule for steel frame elements*

Building element	Steel section dimensions [height x width, mm]	Frame spacing [mm]	Steel thickness [BMT,mm]	Thermal break [R-value]
No Data Available				

* Refer to glossary.

Appliance *schedule*

(not applicable if a Whole of Home performance assessment is not conducted for this certificate)

Note: A flat assumption of 5W/m^2 is used for lighting, therefore lighting is not included in the appliance schedule.

Cooling system

Appliance/ system type	Location	Fuel type	Minimum efficiency/ performance	Recommended capacity
No Data Available				

Heating system

Appliance/ system type	Location	Fuel type	Minimum efficiency/ performance	Recommended capacity
No Data Available				

Hot water system

Appliance/ system type	Fuel type	Hot Water CER Zone	Minimum efficiency /STC	Zone 3 STC	Zone 3 Substitution tolerance ranges		Assessed daily load [litres]
					lower limit	upper limit	
No Data Available							

Pool/spa equipment

Appliance/ system type	Fuel type	Minimum efficiency/ performance	Recommended capacity
No Data Available			

Onsite Renewable Energy *Schedule*

System Type	Orientation	System Size Or Generation Capacity
No Data Available		

Battery *Schedule*

System Type	Size [Battery Storage Capacity]
No Data Available	

* Refer to glossary.

Explanatory notes

About this report

NatHERS ratings are a reliable guide for comparing different dwelling designs and to demonstrate that designs meet the energy efficiency requirements in the National Construction Code.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate data and standard assumptions on how people use their home to predict the heating and cooling energy loads and energy value* of the whole home. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads. The Whole of Home performance rating uses information about the home's appliances and onsite energy generation and storage to estimate the homes energy value*.

The actual energy loads, cost and greenhouse gas emissions of a home may vary from that predicted. This is because the assumptions will not always match the actual occupant usage patterns. For example, the number of occupants and how people use their appliances will vary.

Energy efficient homes use less energy, are warmer on cool days, cooler on hot days and cost less to run.

Accredited assessors

For quality assured NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in the certificate is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical Note to produce a NatHERS Certificate.

The predicted annual energy load, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings 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, behaviour, appliance performance, indoor air temperature and local climate.

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

Glossary

AFRC	Australian Fenestration Rating Council
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, range hoods, 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.
COP	Coefficient of performance
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.
EER	Energy Efficiency Ratio, measure of how much cooling can be achieved by an air conditioner for a single kWh of electricity input
Energy use	This is your homes rating without solar or batteries.
Energy value	The net cost to society including, but not limited to, costs to the building user, the environment and energy networks (as defined in the ABCB Housing Provisions Standard).
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	see exposure categories below.
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 – protected	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category – suburban	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.
Net zero home	a home that achieves a net zero energy value*.
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
Recommended capacity	this is the capacity or size of equipment that is recommended by NatHERS to achieve the desired comfort conditions in the zone or zones serviced. This is a recommendation and the final selection sizing should be confirmed by a suitably qualified person.
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 features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
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.
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.
STCs	Small-scale Technology Certificates, certificates created by the REC registry for renewable energy technologies that may be bought and sold as part of the Small-scale Renewable Energy Scheme operated by the Clean Energy Regulator (CER)
Thermal breaks	are materials with an R-value greater than or equal to 0.2 that must separate the metal frame from the cladding. This includes, but is not limited to, materials such as timber battens greater than or equal to 20mm thick or continuous thermal breaks such as polystyrene insulation sheeting or plastic strips
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).
Window shading device	device fixed to windows that provides shading e.g. window awnings or screens but excludes horizontal* or vertical shading features* (eg eaves and balconies)

* Refer to glossary.