



ENERGY EFFICIENCY REPORT

BASIX® Thermal Comfort Simulation Assessment

SITE ADDRESS

Lot 109 (#120) Forestwood Drive GLENMORE PARK 2745

LOCAL GOVERNMENT AUTHORITY

Penrith City Council

DEPOSITED PLAN

1238043

CLIENT



DWELLING TYPE

Double Storey

COMMISSIONED BY

GJ Gardner Homes

REFERENCE NUMBER

au65-220588_v2.0

ASSESSMENT DATE

28/03/2022

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PROJECT CERTIFICATION SUMMARY

DESIGN AND APPROVED SOFTWARE INFORMATION

SIMULATION ENGINE Chenath Engine v3.21

EXPOSURE Suburban

ORIENTATION: 106

NatHERS CLIMATE ZONE: 28

BCA (NCC) CLIMATE ZONE: 6

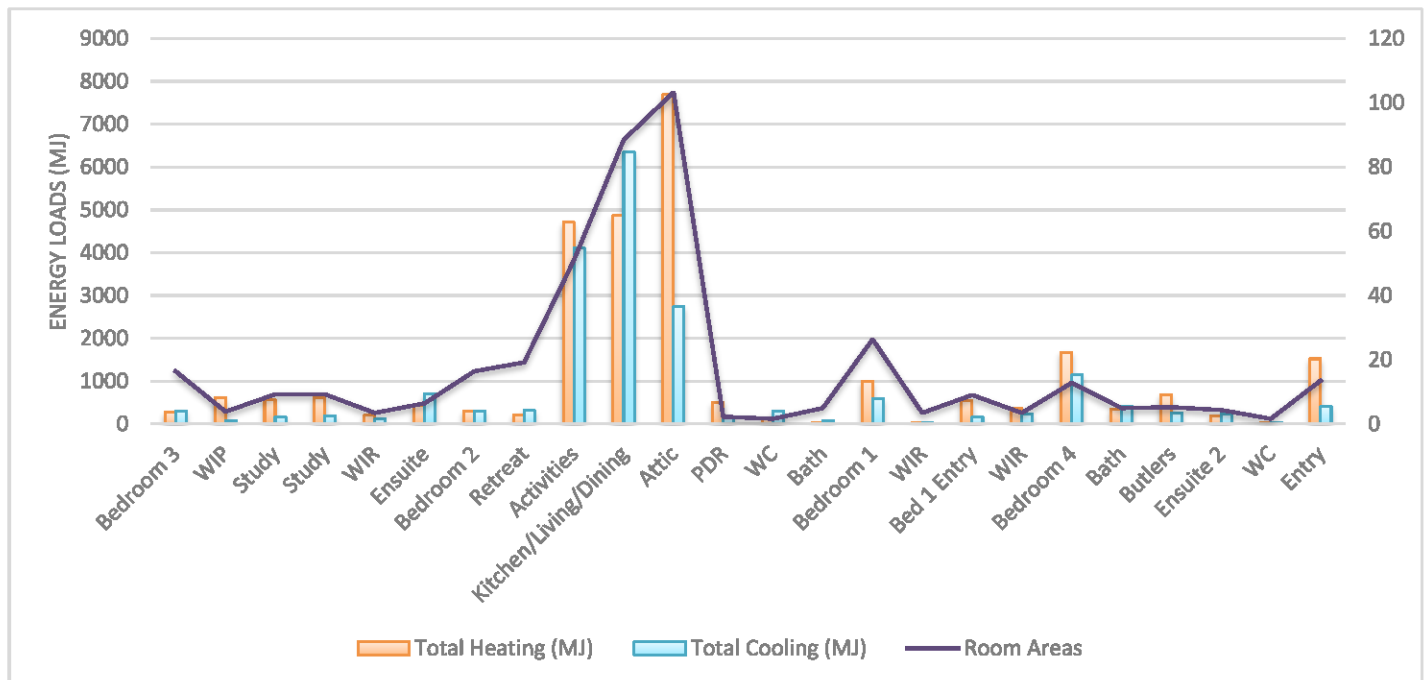
Dwelling Areas (m²)INTERNAL AREAS (m²) 523.71OUTDOOR AREAS (m²) 78.02GARAGE/CARPORT (m²) 54.51**TOTAL: 656.24**

ASSESSMENT CALCULATIONS & SOFTWARE RESULTS

TARGET	(MJ/m ² .pa)	PROPOSED	(MJ/m ² .pa)	BUILD EFFICIENCY BENCHMARK
Heating:	55.7	Heating:	55.6	PASS: 0.2%
Cooling:	56.2	Cooling:	54.6	PASS: 2.9%
Total:	111.9	Total:	110.2	

DWELLING THERMAL PERFORMANCE PER ZONED AREAS

The heating and cooling loads indicated are the simulated annual energy usages (MJ) for this home. The higher the load, the more energy needed to achieve thermal comfort.



STATEMENT OF COMPLIANCE

I / We certify that we are specialists in the relevant discipline and the following design documents comply with the relevant requirements of the National Construction Code (NCC Volume One/Two as applicable) in relation to thermal performance and the relevant Australian Standards specified in this report.

ASSESSOR NAME:

SIGNATURE:

RELEVANT QUALIFICATION STATEMENT

Certificate IV in NatHERS Assessment (Credential Number: TRF0002560)

Residential Building Thermal Performance Assessment (91318NSW) Course

Assessor Accrediting Organisation (AAO) Accreditation Number: **VIC/BDIV/14/1662 | ABSA/61846**

BUILDING SPECIFICATION SUMMARY

EXTERNAL WALLS

	CONSTRUCTION TYPE	INSULATION	NOTES
EXTERNAL WALLS	Framed	None	To the Front Elevation Garage wall (as per drawings)
	Brick Veneer	None	To the remaining Garage walls
	Framed	R2.7 batts (with wall wrap)	Location as per Drawings
	Brick Veneer	R2.7 Batt's	Throughout the remainder
ADDITIONAL NOTES	Location of Construction Materials as per drawings Non-reflective vapour permeable wrap to all insulated external walls		

INTERNAL WALLS

	CONSTRUCTION TYPE	INSULATION	NOTES
INTERNAL WALLS	Framed	R2.0 Batt's	Laundry/Linen internal walls
	Framed	R2.7 Batt's	To the Garage internal walls only
	Framed	None	No insulation to remaining internal walls
ADDITIONAL NOTES			

ROOF AND CEILING

	CONSTRUCTION TYPE	INSULATION	NOTES
ROOF	Colorbond (un-ventilated)	R1.3 Roof Blanket	Approx. 25°00' Roof Pitch
CEILING	Plasterboard	R7.0 Insulation	Main House Area Only
	Plasterboard	None	Garage Ceiling Area
ADDITIONAL NOTES	Roof solar absorbance: Surfmist		

FLOOR

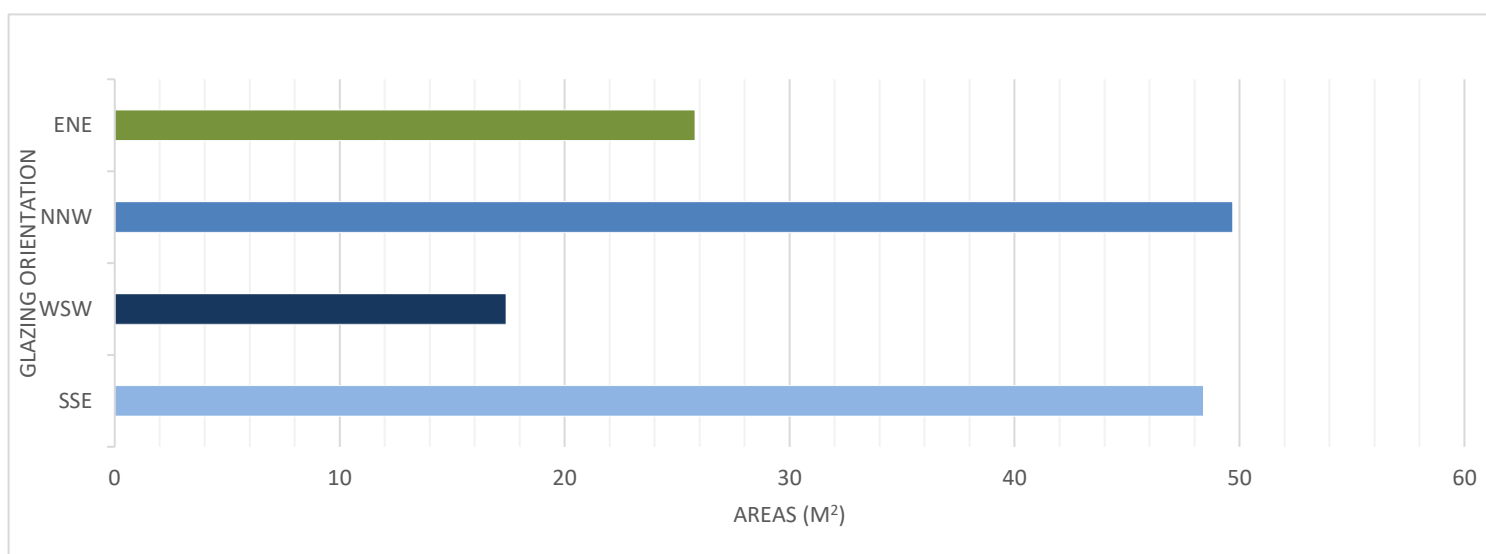
	CONSTRUCTION TYPE	INSULATION	NOTES
FLOOR	300mm Waffle 85mm Slab	R4.0 Batt's	Throughout the Ground Floor
	Framed Suspended	None	To the suspended floor
ADDITIONAL NOTES	Floor Coverings modelled as per Drawings and NatHERS Protocols Slab classification: H		

GLASS TYPE	COLOUR	FRAME	U _w VALUE	SHGC	NOTES
Standard	Clear	Aluminium	6.54	0.67	Awning Windows
Standard	Clear	Aluminium	6.43	0.76	Sliding Windows
Standard	Clear	Aluminium	6.19	0.74	Sliding Doors
Standard	Clear	Aluminium	6.05	0.62	Hinged Doors
Standard	Clear	Aluminium	6.07	0.60	Louvre Windows
Standard	Clear	Aluminium	5.87	0.73	Fixed Windows
Standard	Clear	Aluminium	6.08	0.61	Bifold Window
Double-Glazing	Clear	Aluminium	4.05	0.65	D2, D3 Sliding Doors
Double-Glazing	Clear	Aluminium	3.45	0.67	W15, W20, W22, W23, W24, W25, W31, Fixed Windows
Double-Glazing	Clear	Aluminium	4.35	0.56	W42, W43, W44, W45 Awning Windows

Note: Only a +/-5% SHGC tolerance is allowed with this rating. NB: This tolerance ONLY applies to SHGC, the U-value can always be lower but not higher than the values stated in the report. If any of the windows selected are outside the 5% tolerance then this certificate is no longer valid and the dwelling will need to be rerated to confirm compliance.



GLAZING AREA DIRECTIONS



The chart above indicates the direction of all glazed doors and windows on the external envelope of the dwelling. To increase the thermal performance of the dwelling:

1. Maximise unsheltered northern-aspect glazing.
2. Keep west-facing glazing as small as possible: total window area should be less than 5% of the home's total floor area.
3. Keep south-facing glazing reasonably small: total window area should be less than 5% of the home's total floor area. Maximise the openable area if possible.
4. Keep east-facing glazing to a modest size: total window area should be less than 8% of the home's total floor area

Refer to the floor and elevation plans for shading location

LIGHTING/PENETRATION CALCULATIONS

ARTIFICIAL LIGHTING CALCULATION ALLOWANCES

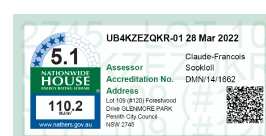
AREA WITHIN THE CLASS 1 BUILDING	523.71 m ²		
Development Total	2618.6 Watts	Area Wattage Allowance	5.0 W/m ²
AREA WITHIN THE CLASS 10 BUILDING	54.51 m ²		
Development Total	163.5 Watts	Area Wattage Allowance	3.0 W/m ²
AREA WITHIN THE OUTDOOR AREAS	78.02 m ²		
Development Total	312.1 Watts	Area Wattage Allowance	4.0 W/m ²

CEILING INSULATION PENETRATION ALLOWANCE

CLASS 1 MAXIMUM PENETRATION ALLOWANCE	CLASS 1 MAXIMUM PENETRATION AREA (m ²)
0.5% TOTAL INSULATED CEILING AREA	2.62

The clearance required around downlights by "Australian Standard AS/NZS 3000 – 2007 Electrical Installations" (AS/NZS 3000), introduces a significant area of uninsulated ceiling and therefore increases heat loss and gain through the ceiling.

If approved fireproof downlight covers, which can be fully covered by insulation, are specified and noted on the electrical plan by the building designer or architect, then there is no need to allow for the ceiling penetration



NSW ADDITIONS: BUILDING FABRIC THERMAL INSULATION

NSW 3.12.1 APPLICATION OF NSW PART 3.12.1

- (a) Compliance with NSW 3.12.1.1 satisfies NSW P2.6.1(a) for thermal insulation and thermal breaks.
- (b) NSW PART 3.12.1 only applies to thermal insulation in a Class 1 or 10 building where a development consent specifies that the insulation is to be provided as part of the development.
- (c) In (b), the term development consent has the meaning given by the Environmental Planning and Assessment Act 1979.
- (d) The Deemed-to-Satisfy Provisions of this Part for thermal breaks apply to all Class 1 buildings and Class 10a buildings with a conditioned space.

NSW 3.12.1.1 COMPLIANCE WITH BCA PROVISIONS

- (a) Thermal insulation in a building must comply with the national BCA provisions of 3.12.1.1.
- (b) A thermal break must be provided between the external cladding and framing in accordance with national BCA provisions of—
 - (i) 3.12.1.2(c) for a metal framed roof; and
 - (ii) 3.12.1.4(b) for a metal framed wall.
- (c) Compensation for reduction in ceiling insulation must comply with the national BCA provisions of 3.12.1.2(e).
- (d) A floor with an in-slab or in-screed heating or cooling system must comply with the national BCA provisions of—
 - (i) 3.12.1.5(a)(ii), (iii) and (e) for a suspended floor; or
 - (ii) 3.12.1.5(c), (d) and (e) for a concrete slab-on-ground.

BUILDING SEALING & SERVICES

NSW 3.12.3 APPLICATION OF NSW PART 3.12.3

- (a) Compliance with NSW 3.12.3.1 satisfies NSW P2.6.1(b) for building sealing.
- (b) NSW Part 3.12.3 is not applicable to—
 - (i) existing buildings being relocated; or
 - (ii) Class 10a buildings—
 - (A) without a conditioned space; or
 - (B) for the accommodation of vehicles; or
 - (iii) parts of buildings that cannot be fully enclosed; or
 - (iv) a permanent building opening, in a space where a gas appliance is located, that is necessary for the safe operation of a gas appliance; or
 - (v) a building in climate zones 2 and 5 where the only means of air-conditioning is by using an evaporative cooler.

NSW 3.12.3.1 COMPLIANCE WITH BCA PROVISIONS

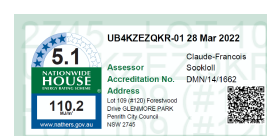
The sealing of a building must comply with the national BCA provisions 3.12.3.1 to 3.12.3.6.

NSW 3.12.5 SERVICES: APPLICATION OF NSW PART 3.12.5

- (a) Compliance with NSW 3.12.5.1 satisfies NSW P2.6.2 for services.
- (b) NSW Part 3.12.5 is not applicable to existing services associated with existing buildings being relocated.

NSW 3.12.5.1 COMPLIANCE WITH BCA PROVISIONS

Services must comply with the national BCA provisions 3.12.5.0 to 3.12.5.3.



Nationwide House Energy Rating Scheme

NatHERS Certificate No. UB4KZEZQKR-01

Generated on 28 Mar 2022 using FirstRate5: 5.3.2a (3.21)

Property

Address Lot 109 (#120) Forestwood Drive GLENMORE PARK, Penrith
City Council, NSW, 2745
Lot/DP 109 / 1238043
NCC Class* Class 1a
Type New Home

Plans

Main plan au65-220588
Prepared by GJ Gardner Homes

Construction and environment

Assessed floor area (m²)*		Exposure type
Conditioned*	465.5	suburban
Unconditioned*	63.8	NatHERS climate zone
Total	529.3	28 Richmond
Garage	53.5	



Accredited assessor

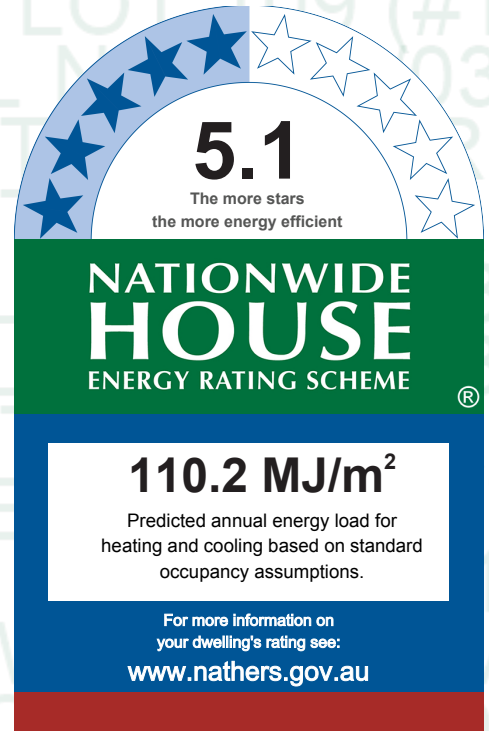
Name Claude-Francois Sookloll
Business name Energy Advance
Email energy@energyadvance.com.au
Phone 1300 850 228
Accreditation No. DMN/14/1662
Assessor Accrediting Organisation Design Matters National
Declaration of interest Declaration completed: no conflicts

National Construction Code (NCC) requirements

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

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

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



Thermal performance

Heating	Cooling
55.6	54.6
MJ/m²	MJ/m²

About the rating

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

Verification

To verify this certificate, scan the QR code or visit <https://www.fr5.com.au/QRCodeLanding?PublicId=UB4KZEZQKR-01> When using either link, ensure you are visiting www.FR5.com.au.



Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

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

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Additional Notes

BCA Climate Zone 6

Please note, a non-reflective vapour permeable wall wrap has been modelled throughout the external walls of this dwelling

Perimeter insulation has not been included in the modelling of this dwelling

Eaves indicated by the 'Horizontal shading feature* maximum projection (mm)' may not be directly opposing the respective wall (i.e. some eaves may be horizontally offset)

Where applicable, an additional 150mm has been added to the projection of all 'Horizontal shading features & eaves' to account for the Gutter & Fascia Board

Please note, restricted window openings (%) have been modelled as per NCC 2019 requirements

Window and glazed door *type and performance*

Default* windows

				Substitution tolerance ranges	
Window ID	Window description	Maximum U-value*	SHGC*	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
BRD-033-01 A	ESS Sliding Door (80mm) SG 4Clr	6.19	0.74	0.7	0.78
BRD-030-01 A	ESS Hinged Door (100mm) SG 4Clr	6.05	0.62	0.59	0.65
BRD-112-01 A	ESS Awning 52 SG 4mmClr	6.54	0.67	0.64	0.7

* Refer to glossary

BRD-001-01 A	ESS Sliding Window (52mm) SG 3Clr	6.43	0.76	0.72	0.8
BRD-063-19 A	SIG Fixed Lite (67mm) SG 638ClrLam	5.9	0.72	0.68	0.76
BRD-043-01 A	SIG Louvre Window (125mm) SG 6Clr	6.07	0.6	0.57	0.63
BRD-125-57 A	ESS Fixed Window External 52 Comm DG 4mmClr_6Ar_4mmClr	3.45	0.67	0.64	0.7
BRD-113_47 A	ESS Awning 52 DG 4mmClr_6Ar_4mmClr	4.35	0.56	0.53	0.59
BRD-125-49 A	ESS Fixed Window External 52 Comm DG 4mmSngy_6Ar_4mmClr	3	0.47	0.45	0.49
BRD-035-01 A	SIG Sliding Door (100mm) DG 4/6/4	4.05	0.65	0.62	0.68
BRD-124_37 A	ESS Fixed Window External 52 SG 5mmClr	5.87	0.73	0.69	0.77
BRD-006-01 A	SIG Bi Fold Door (100mm) SG 4Clr	6.08	0.61	0.58	0.64

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Bedroom 1	BRD-033-01 A	D5	2400	3100	sliding	45.0	SSE	No
Bedroom 2	BRD-030-01 A	Opening 34	2100	1440	casement	90.0	NNW	No
Bedroom 2	BRD-112-01 A	W1	2100	450	awning	90.0	NNW	No
Bedroom 2	BRD-112-01 A	W2	2100	450	awning	90.0	NNW	No
Bedroom 3	BRD-030-01 A	Opening 35	2100	1440	casement	90.0	NNW	No
Bedroom 3	BRD-112-01 A	W3	2100	450	awning	90.0	NNW	No
Bedroom 3	BRD-112-01 A	W4	2100	450	awning	90.0	NNW	No
Bedroom 4	BRD-001-01 A	W39	1460	1810	sliding	45.0	WSW	No
Retreat	BRD-033-01 A	D1	2400	2100	sliding	45.0	SSE	No
Retreat	BRD-112-01 A	W12	700	1810	awning	45.0	ENE	No
Living	BRD-112-01 A	W9	2100	600	awning	60.0	ENE	No
Living	BRD-112-01 A	W10	2100	600	awning	60.0	ENE	No
Living	BRD-030-01 A	Opening 36	2100	1440	casement	90.0	NNW	No
Living	BRD-030-01 A	Opening 37	2100	1440	casement	90.0	NNW	No
Living	BRD-112-01 A	W5	2100	450	awning	90.0	NNW	No
Living	BRD-112-01 A	W6	2100	450	awning	90.0	NNW	No
Living	BRD-112-01 A	W7	2100	450	awning	90.0	NNW	No
Living	BRD-112-01 A	W8	2100	450	awning	90.0	NNW	No
Activities	BRD-063-19 A	W18	950	850	fixed	0.0	ENE	No
Activities	BRD-063-19 A	W17	2400	3000	fixed	0.0	SSE	No
Activities	BRD-063-19 A	W17	2400	850	fixed	0.0	WSW	No
Activities	BRD-043-01 A	W14	2400	600	louvre	90.0	SSE	No
Activities	BRD-043-01 A	W16	2400	600	louvre	90.0	SSE	No
Activities	BRD-125-57 A	W15	2400	2100	fixed	0.0	SSE	No
Kitchen/Living/- Dining	BRD-125-57 A	W22	2400	900	fixed	0.0	NNW	No

Kitchen/Living/-Dining	BRD-125-57 A	W25	2400	900	fixed	0.0	NNW	No
Kitchen/Living/-Dining	BRD-113_47 A	W23	450	900	fixed	0.0	NNW	No
Kitchen/Living/-Dining	BRD-113_47 A	W26	450	900	fixed	0.0	NNW	No
Kitchen/Living/-Dining	BRD-125-49 A	W24	450	5400	fixed	0.0	NNW	No
Kitchen/Living/-Dining	BRD-035-01 A	D2	2400	5400	other	60.0	NNW	No
Kitchen/Living/-Dining	BRD-125-57 A	W31	450	5400	fixed	0.0	SSE	No
Kitchen/Living/-Dining	BRD-035-01 A	D3	2400	5400	other	60.0	SSE	No
Lounge	BRD-043-01 A	W19	2400	600	louvre	90.0	ENE	No
Lounge	BRD-043-01 A	W21	2400	600	louvre	60.0	ENE	No
Lounge	BRD-125-57 A	W20	2400	2700	fixed	0.0	ENE	No
Entry	BRD-030-01 A	Opening 33	2100	1440	casement	90.0	NNW	No
Entry	BRD-124_37 A	Opening 38	2100	250	fixed	0.0	NNW	No
Entry	BRD-124_37 A	Opening 39	2100	250	fixed	0.0	NNW	No
Butlers	BRD-006-01 A	W34	1460	1570	other	90.0	ENE	No
Study	BRD-124_37 A	W35	700	2100	fixed	0.0	SSE	No
Study	BRD-033-01 A	D4	2400	1500	sliding	45.0	ENE	No
WC	BRD-112-01 A	W11	2100	850	awning	60.0	ENE	No
Ensuite 2	BRD-001-01 A	W38	1200	1210	sliding	45.0	WSW	No
Laundry	BRD-033-01 A	D6	2400	1500	sliding	45.0	WSW	No
Ensuite	BRD-001-01 A	W37	1460	1810	sliding	45.0	WSW	No
Garage	BRD-001-01 A	W41	600	2410	sliding	45.0	WSW	No
Storage	BRD-001-01 A	W40	600	900	sliding	45.0	WSW	No
Attic	BRD-125-57 A	W45	1800	3000	fixed	0.0	SSE	No
Attic	BRD-113_47 A	W42	1460	850	awning	10.0	NNW	No
Attic	BRD-113_47 A	W43	1460	850	awning	10.0	NNW	No
Attic	BRD-113_47 A	W44	1460	850	awning	10.0	NNW	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

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit

No Data Available

Roof window *schedule*

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

Skylight *type and performance*

Skylight ID	Skylight description
No Data Available	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m ²)	Orient-ation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Garage	2700	5300	100.0	NNW
Storage	2340	820	100.0	WSW

External wall *type*

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	STANDARD - Brick Veneer - R2.7 Batts	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	No
2	REFLECTIVE - Framed Slim (Generic) - R2.7 Batts + Wrap	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m ³) (R2.7)	Yes
3	STANDARD - Framed - Uninsulated (Generic)	0.5	Medium		No
4	STANDARD - Brick Veneer	0.5	Medium		No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 1	1	2750	4719	SSE	586	Yes
Bedroom 1	1	2750	4680	WSW	586	Yes
Bedroom 2	2	2750	3564	NNW	1739	No
Bedroom 2	2	2750	2690	WSW	2869	Yes
Bedroom 3	2	2750	930	ENE	0	Yes
Bedroom 3	2	2750	3565	NNW	1739	No
Bedroom 4	1	2750	3000	WSW	586	Yes
Retreat	2	2750	3940	SSE	699	No
Retreat	2	2750	3530	ENE	699	Yes
Retreat	2	2750	600	SSE	0	Yes

* Refer to glossary.



Retreat	2	2750	2050	ENE	0	Yes
WIR	1	2750	2800	WSW	586	Yes
Living	2	2750	4320	ENE	0	Yes
Living	2	2750	5469	NNW	2669	Yes
Activities	2	2750	1800	ENE	699	Yes
Activities	2	2750	4709	SSE	0	Yes
Activities	2	2750	1770	WSW	699	Yes
Activities	2	2750	4949	SSE	699	No
Kitchen/Living/Dining	1	3600	7400	ENE	586	Yes
Kitchen/Living/Dining	2	3600	9884	NNW	699	Yes
Kitchen/Living/Dining	2	3600	599	ENE	725	Yes
Kitchen/Living/Dining	2	3600	9149	SSE	5862	Yes
Lounge	2	2750	4987	ENE	699	Yes
Entry	2	2750	2256	NNW	4429	Yes
WIP	2	2750	1360	ENE	8229	Yes
Butlers	2	2750	1840	ENE	8229	Yes
Study	1	2750	2800	SSE	586	Yes
Study	2	2750	1700	ENE	8229	Yes
WC	2	2750	1800	ENE	0	Yes
WC	2	2750	900	SSE	0	Yes
Ensuite 2	1	2750	2900	WSW	586	Yes
Laundry	1	2750	2500	WSW	586	Yes
Ensuite	1	2750	3320	WSW	586	Yes
Linen	1	2750	1610	WSW	586	Yes
Garage	3	3590	1617	ENE	0	Yes
Garage	3	3590	6899	NNW	1365	No
Garage	4	3590	6000	WSW	0	Yes
Storage	4	3590	2600	WSW	0	Yes
Attic	2	2400	4472	SSE	0	No
Attic	2	2400	1620	NNW	0	No
Attic	2	2400	1000	WSW	0	Yes
Attic	2	2400	2215	NNW	0	Yes
Attic	2	2400	1000	ENE	0	Yes
Attic	2	2400	1620	NNW	0	No
Attic	2	2400	1000	WSW	0	Yes
Attic	2	2400	2215	NNW	0	Yes
Attic	2	2400	1000	ENE	0	Yes
Attic	2	2400	1620	NNW	0	No
Attic	2	2400	1000	WSW	0	Yes
Attic	2	2400	2640	NNW	0	Yes
Attic	2	2400	8367	WSW	0	No

Internal wall type

Wall ID	Wall type	Area (m ²)	Bulk insulation
1	STANDARD - Internal Stud Walls	363	
2	STANDARD - Internal Stud Walls -R2.0 Batts	27.6	Glass fibre batt: R2.0 (R2.0)
3	STANDARD - Internal Stud Walls -R2.7 Batts	46.5	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)
4	REFLECTIVE - Framed Slim (Generic) - R2.7 Batts + Wrap	40.4	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)

Floor type

Location	Construction	Area (m ²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	26.4	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	9.6	Enclosed	R0.0	Carpet
Bedroom 2	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	6.8	Enclosed	R0.0	Carpet
Bedroom 3	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	16.4	Enclosed	R0.0	Carpet
Bedroom 4	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	6	Enclosed	R0.0	Carpet
Bedroom 4	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	6.8	Enclosed	R0.0	Carpet
Retreat	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	19.2	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	3.4	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	8.8	Enclosed	R0.0	Carpet
Living	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	27.4	Enclosed	R0.0	Timber
Activities	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	0.4	Enclosed	R0.0	Timber
Activities	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	29.3	Enclosed	R0.0	Timber
Activities	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	18.6	Enclosed	R0.0	Timber
Activities	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	2.6	Enclosed	R0.0	Timber
Kitchen/Living/Dining	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	88.4	Enclosed	R0.0	Timber
Lounge	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	26.3	Enclosed	R0.0	Timber
Entry	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	13.5	Enclosed	R0.0	Timber
Study	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	0	Enclosed	R0.0	Timber
Study	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	9.2	Enclosed	R0.0	Timber
WIP	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	3.8	Enclosed	R0.0	Timber
Butlers	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	5.2	Enclosed	R0.0	Timber
Study	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	4.8	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	0	Enclosed	R0.0	Carpet
WIR	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	2.1	Enclosed	R0.0	Carpet
WC	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	1.6	Enclosed	R0.0	Tiles
Bath	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	4.9	Enclosed	R0.0	Tiles
Bath	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	5.4	Enclosed	R0.0	Tiles
WC	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	2.9	Enclosed	R0.0	Tiles
Ensuite 2	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	4.3	Enclosed	R0.0	Tiles
Laundry	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	7.8	Enclosed	R0.0	Tiles

Ensuite	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	6.4	Enclosed	R0.0	Tiles
WC	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	1.3	Enclosed	R0.0	Tiles
PDR	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	2.2	Enclosed	R0.0	Tiles
Linen	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	2.4	Enclosed	R0.0	Tiles
Bed 1 Entry	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	9	Enclosed	R0.0	Timber
Garage	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	8.2	Enclosed	R0.0	none
Garage	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	37.5	Enclosed	R0.0	none
Storage	FR5 - 300mm waffle pod, 85mm concrete (R0.63)	7.9	Enclosed	R0.0	none
Attic	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	103.3	Enclosed	R4.0	Carpet

Ceiling type

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 1	Plasterboard	R7.0	Yes
Bedroom 2	Plasterboard	R7.0	Yes
Bedroom 2	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Bedroom 3	Plasterboard	R7.0	Yes
Bedroom 4	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Bedroom 4	Plasterboard	R0.0	No
Retreat	Plasterboard	R7.0	Yes
WIR	Plasterboard	R7.0	Yes
WIR	Plasterboard	R7.0	Yes
Living	Plasterboard	R7.0	Yes
Activities	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Activities	Plasterboard	R7.0	Yes
Activities	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Activities	Plasterboard	R0.0	No
Kitchen/Living/Dining	Plasterboard	R7.0	Yes
Lounge	Plasterboard	R7.0	Yes
Entry	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Study	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
WIP	Plasterboard	R7.0	Yes
Butlers	Plasterboard	R7.0	Yes
Study	Plasterboard	R7.0	Yes
WIR	Plasterboard	R0.0	No
WC	Plasterboard	R7.0	Yes

Bath	Plasterboard	R7.0	Yes
Bath	Plasterboard	R7.0	Yes
WC	Plasterboard	R7.0	Yes
Ensuite 2	Plasterboard	R7.0	Yes
Laundry	Plasterboard	R7.0	Yes
Ensuite	Plasterboard	R7.0	Yes
WC	Plasterboard	R7.0	Yes
PDR	Plasterboard	R7.0	Yes
Linen	Plasterboard	R7.0	Yes
Bed 1 Entry	Plasterboard	R7.0	Yes
Garage	Plasterboard	R0.0	Yes
Garage	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Storage	FLOOR - Framed Internal Suspended Floor (R4.0 Insulation)	R4.0	No
Attic	Plasterboard	R7.0	Yes

Ceiling penetrations*

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Kitchen/Living/Dining	1	Exhaust Fans	185	Sealed
Bath	1	Exhaust Fans	250	Sealed
Bath	1	Exhaust Fans	250	Sealed
WC	1	Exhaust Fans	250	Sealed
Ensuite 2	1	Exhaust Fans	250	Sealed
Ensuite	1	Exhaust Fans	250	Sealed
WC	1	Exhaust Fans	250	Sealed
PDR	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
Cont:Attic-Continuous	1.3	0.32	Light
Ceil: Ceiling	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 NatHERS Administrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

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

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

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).