



ENERGY EFFICIENCY REPORT

BASIX® Thermal Comfort Simulation Assessment

SITE ADDRESS

Lot 1 (#7) Sir Thomas Mitchell Drive DAVIDSON 2085

LOCAL GOVERNMENT AUTHORITY

Northern Beaches Council

CLIENT

Mr & Mrs Abu-Ali

COMMISSIONED BY

Meticon Homes

ASSESSMENT DATE

30/11/2023

DEPOSITED PLAN

242262

DWELLING TYPE

Double Storey

REFERENCE NUMBER

741616_v4.1

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PROJECT CERTIFICATION SUMMARY

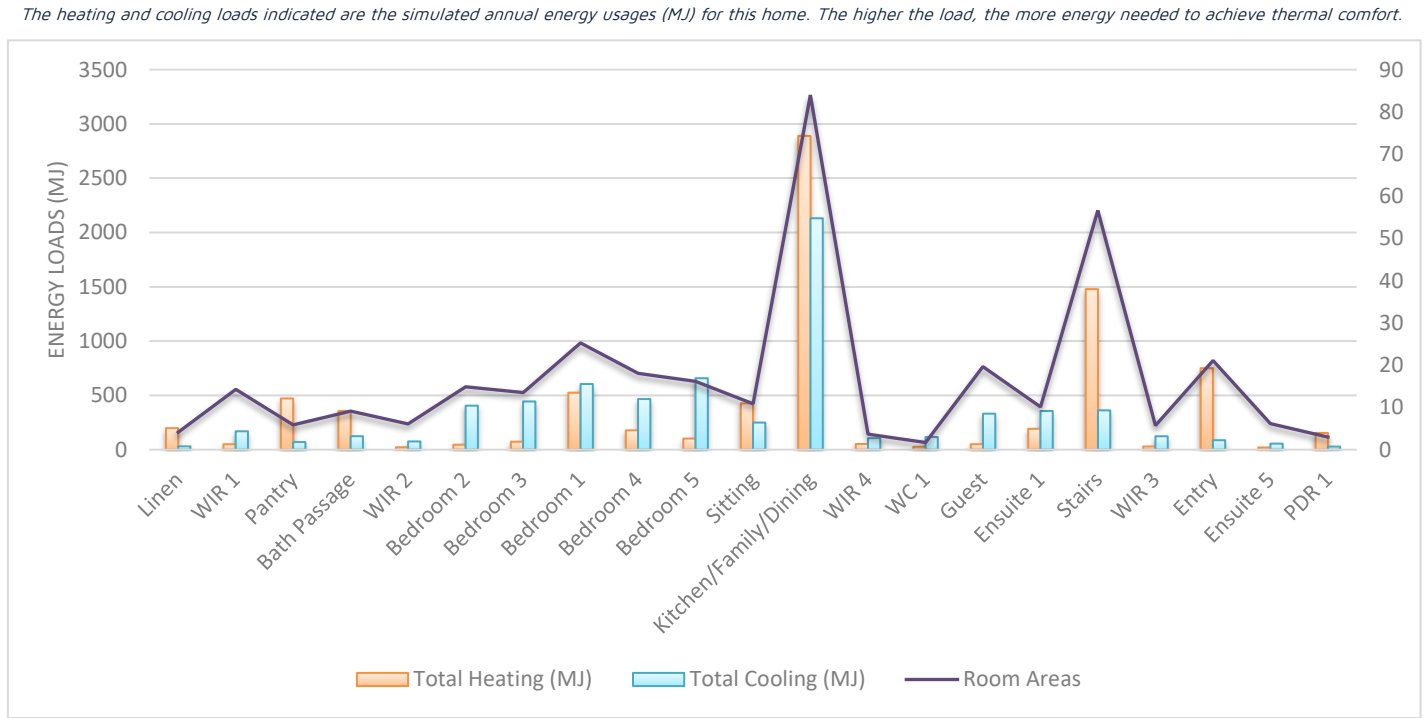
DESIGN AND APPROVED SOFTWARE INFORMATION

| | | | |
|-------------------------|----------------------|----------------------------------|--------|
| SIMULATION ENGINE | Chenath Engine v3.21 | Dwelling Areas (m ²) | |
| EXPOSURE | Suburban | INTERNAL AREAS (m ²) | 421.09 |
| ORIENTATION: | 75 | OUTDOOR AREAS (m ²) | 72.78 |
| NatHERS CLIMATE ZONE: | 56 | GARAGE/CARPORT (m ²) | 39.67 |
| BCA (NCC) CLIMATE ZONE: | 5 | TOTAL: | 533.54 |

ASSESSMENT CALCULATIONS & SOFTWARE RESULTS

| TARGET | (MJ/m ² .pa) | PROPOSED | (MJ/m ² .pa) | BUILD EFFICIENCY BENCHMARK |
|----------|-------------------------|----------|-------------------------|----------------------------|
| Heating: | 40.0 | Heating: | 24.0 | PASS: 50.0% |
| Cooling: | 26.0 | Cooling: | 25.5 | PASS: 1.9% |
| Total: | 66.0 | Total: | 49.5 | |

DWELLING THERMAL PERFORMANCE PER ZONED AREAS



STATEMENT OF COMPLIANCE

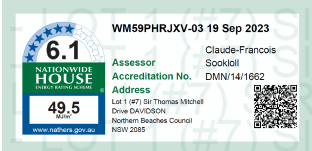
I / We certify that we are specialists in the relevant discipline and the following design documents comply with the relevant requirements of the National Construction Code (NCC Volume One/Two as applicable) in relation to thermal performance and the relevant Australian Standards specified in this report.

ASSESSOR NAME: C Sookloll

SIGNATURE:

RELEVANT QUALIFICATION STATEMENT

Certiificate IV in NatHERS Assessment (Credential Number: TRF0002560)
Residential Building Thermal Performance Assessment (91318NSW) Course
Assessor Accrediting Organisation (AAO) Accreditation Number: **VIC/BDV/14/1662 | ABSA/61846**



BUILDING SPECIFICATION SUMMARY

EXTERNAL WALLS

| | CONSTRUCTION TYPE | INSULATION | NOTES |
|------------------|---|-----------------------------|--|
| EXTERNAL WALLS | Brick Masonry | None | To the Front Elevation Garage wall (as per drawings) |
| | Brick Veneer | None | To the remainder of Garage external walls |
| | EPS Panel | R2.5 batts (with wall wrap) | To the Front Façade |
| | Brick Veneer | R2.5 batts (with wall wrap) | 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 | To the PDR 2 & Laundry internal walls |
| | Framed | R1.5 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. 2"0' Roof Pitch |
| CEILING | Plasterboard | R6.0 Insulation | Main House Area Only |
| | Plasterboard | None | Garage Ceiling Area |
| ADDITIONAL NOTES | Worst case roof colour has been modelled: Dark | | |

FLOOR

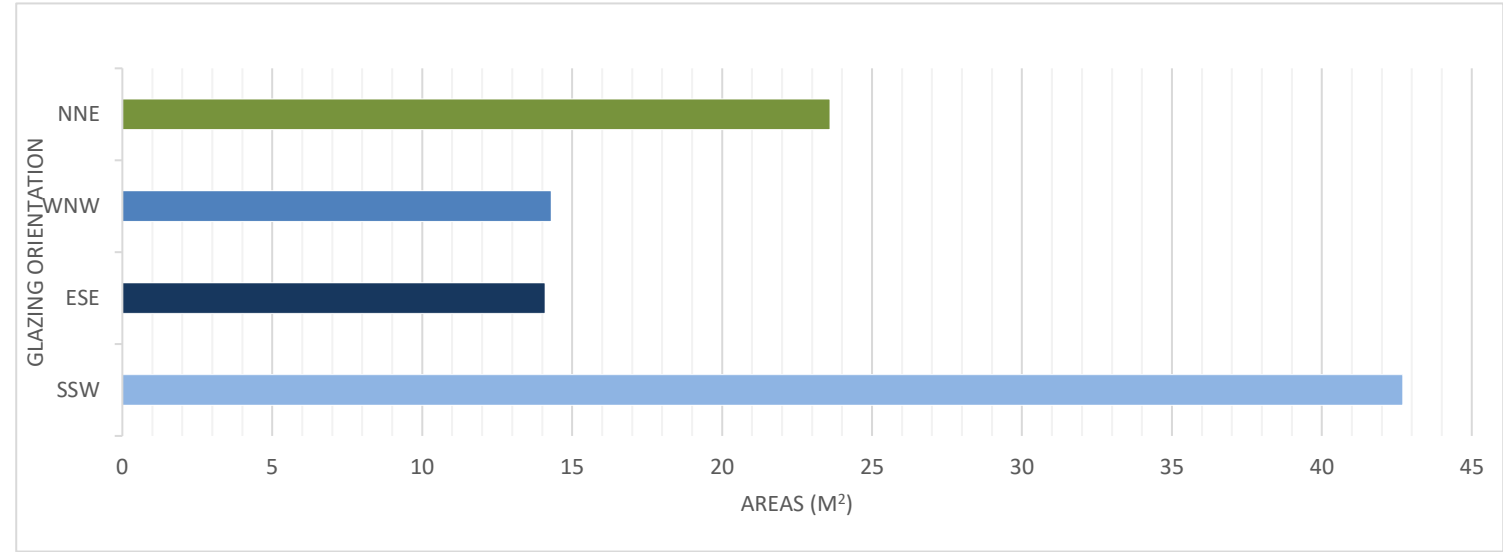
| | CONSTRUCTION TYPE | INSULATION | NOTES |
|------------------|---|-------------|---------------------------------------|
| FLOOR | 225mm Waffle 85mm Slab | Integrated | To the Ground Floor (as per drawings) |
| | Framed Suspended | R4.0 Batt's | To the Upper Floor (as per drawings) |
| ADDITIONAL NOTES | Floor Coverings modelled as per Drawings and NatHERS Protocols Slab classification: M | | |

| GLASS TYPE | COLOUR | FRAME | U _w VALUE | SHGC | NOTES |
|----------------|--------|-----------|----------------------|------|---|
| Standard | Clear | Aluminium | 6.26 | 0.66 | Bath, PDR 2, Bath, Ensuite 5, WC 1 Awning Windows |
| Standard | Clear | Aluminium | 6.70 | 7.00 | Pantry, Ensuite 1 Fixed Windows |
| Standard | Clear | Timber | 5.40 | 0.56 | Laundry Door |
| Standard | Clear | Timber | 5.40 | 0.63 | Sidelight |
| Double-Glazing | Clear | Aluminium | 3.66 | 0.65 | Stacker Doors |
| Double-Glazing | Clear | Aluminium | 4.80 | 0.59 | Fixed Windows |
| Double-Glazing | Clear | Aluminium | 3.79 | 0.60 | Awning Windows |
| Double-Glazing | Clear | Aluminium | 4.80 | 0.51 | Bifold Door |
| Double-Glazing | Clear | Aluminium | 3.66 | 0.65 | Sliding Door |

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 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 | 421.09 m² | | |
| Development Total | 2105.5 Watts | Area Wattage Allowance | 5.0 W/m² |

| | | | |
|-----------------------------------|-------------|------------------------|----------|
| AREA WITHIN THE CLASS 10 BUILDING | 39.67 m² | | |
| Development Total | 119.0 Watts | Area Wattage Allowance | 3.0 W/m² |

| | | | |
|-------------------------------|-------------|------------------------|----------|
| AREA WITHIN THE OUTDOOR AREAS | 72.78 m² | | |
| Development Total | 291.1 Watts | Area Wattage Allowance | 4.0 W/m² |

CEILING INSULATION PENETRATION ALLOWANCE

| | |
|---------------------------------------|---------------------------------------|
| CLASS 1 MAXIMUM PENETRATION ALLOWANCE | CLASS 1 MAXIMUM PENETRATION AREA (m²) |
| 0.5% TOTAL INSULATED CEILING AREA | 2.11 |

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.
- APPENDIX E: NCC 2022 7 STAR UPGRADE OPTION (Modelled in FR5 Beta Version)
- Inclusive of these specifications as listed below:
- R2.5 external walls (ex. Garage) with VP wrap

R6.0 ceiling insulation with R2.5 AS3999 requirement (ex. Garage)

R2.5 to the internal garage walls + R2.0 batts to the unconditioned wet-areas internal walls

R4.0 insulation to the floor above outdoor areas only AND over garage areas

300/85 Waffle Pod

Roof: Tiled

Roof Colour: Medium

No ceiling fans

No Sarking

Exhaust Fans to all WCs, Baths and Ensuites + Kitchen Rangehood

Floor Coverings: Kitchen Zone and Passageways: Timber | Bedrooms/Study/Living: Carpet | Wet-Areas: Tiled

Eaves: As per Drawings
-
- GLAZING
-
- energy@energyadvance.com.au

Energy Advance Australia Pty Ltd

(ACN: 60 9332014)

1300 850 228

Nationwide House Energy Rating Scheme

NatHERS Certificate No. WM59PHRJXV-03

Generated on 19 Sep 2023 using FirstRate5: 5.3.2b (3.21)

Property

Address Lot 1 (#7) Sir Thomas Mitchell Drive DAVIDSON, Northern Beaches Council, NSW, 2085
Lot/DP 1 / 242262
NCC Class* Class 1a
Type New Home

Plans

Main plan 741616

Prepared by -

Construction and environment

| | | |
|---|-------|-----------------------------|
| Assessed floor area (m²)* | | Exposure type |
| Conditioned* | 323.3 | suburban |
| Unconditioned* | 51.3 | NatHERS climate zone |
| Total | 374.6 | 56 Mascot AMO |
| Garage | 35.5 | |



Accredited assessor

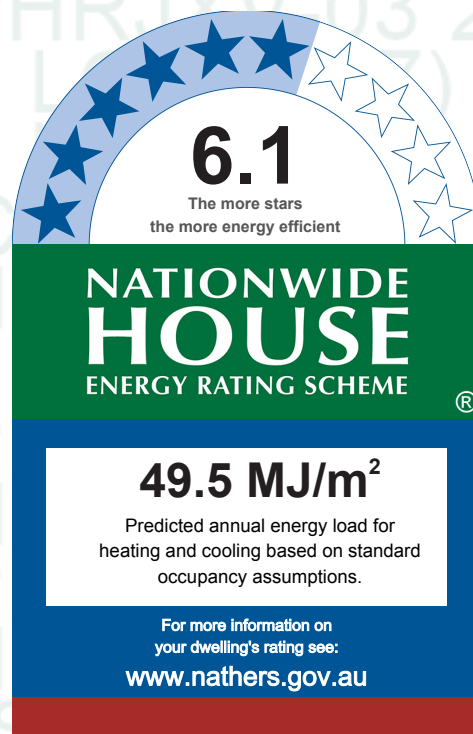
Name Claude-Francois Sookloll
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Email energy@energyadvance.com.au
Phone 1300 850 228
Accreditation No. DMN/14/1662
Assessor Accrediting Organisation Design Matters National
Declaration of interest Declaration completed: no conflicts

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 |
| 24 | 25.5 |
| MJ/m² | MJ/m² |

About the rating

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

Verification

To verify this certificate, scan the QR code or visit <https://www.fr5.com.au/QRCodeLanding?PublicId=WM59PHRJXV-03> 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 5

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

| Window ID | Window description | Maximum U-value* | SHGC* | Substitution tolerance ranges | |
|--------------|-------------------------------------|------------------|-------|-------------------------------|------------------|
| | | | | SHGC lower limit | SHGC upper limit |
| ALM-003-01 A | Aluminium A DG Air Fill Clear-Clear | 4.8 | 0.51 | 0.48 | 0.54 |
| ALM-004-01 A | Aluminium B DG Air Fill Clear-Clear | 4.8 | 0.59 | 0.56 | 0.62 |
| TIM-001-01 W | Timber A SG Clear | 5.4 | 0.56 | 0.53 | 0.59 |
| ALM-002-01 A | Aluminium B SG Clear | 6.7 | 0.7 | 0.66 | 0.74 |

Custom* windows

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

* Refer to glossary.

| | | | | | |
|--------------|---|------|------|------|------|
| SSW-009-07 A | 200 SERIES - ALUMINIUM SLIDING DOOR DG 3-12Ar-3 | 3.66 | 0.65 | 0.62 | 0.68 |
| SSW-011-01 A | 100 Series Awning Window DG 3-12Ar-3 | 3.79 | 0.6 | 0.57 | 0.63 |
| SSW-010-07 A | 100 Series Awning Window SG 3Clr | 6.26 | 0.66 | 0.63 | 0.69 |

Window and glazed door *Schedule*

| Location | Window ID | Window no. | Height (mm) | Width (mm) | Window type | Opening % | Orientation | Window shading device* |
|------------------------|--------------|------------|-------------|------------|-------------|-----------|-------------|------------------------|
| Kitchen/Family/-Dining | SSW-009-07 A | Opening 57 | 2680 | 3100 | sliding | 60.0 | SSW | No |
| Kitchen/Family/-Dining | ALM-003-01 A | Opening 41 | 2680 | 2710 | other | 90.0 | SSW | No |
| Kitchen/Family/-Dining | SSW-009-07 A | Opening 57 | 2680 | 4000 | sliding | 60.0 | SSW | No |
| Kitchen/Family/-Dining | SSW-011-01 A | Opening 53 | 2300 | 600 | awning | 90.0 | ESE | No |
| Kitchen/Family/-Dining | ALM-004-01 A | Opening 35 | 1457 | 1210 | fixed | 0.0 | WNW | No |
| Laundry | TIM-001-01 W | Opening 38 | 1400 | 820 | casement | 100.0 | WNW | No |
| Pantry | ALM-002-01 A | Opening 36 | 686 | 1810 | fixed | 0.0 | WNW | No |
| Ensuite 5 | SSW-010-07 A | Opening 33 | 2000 | 600 | awning | 90.0 | ESE | No |
| Sitting | SSW-011-01 A | Opening 53 | 2370 | 2170 | awning | 30.0 | NNE | No |
| Bedroom 5 | SSW-009-07 A | Opening 34 | 2400 | 2400 | sliding | 45.0 | ESE | No |
| Bedroom 5 | SSW-011-01 A | Opening 53 | 2370 | 1210 | awning | 45.0 | NNE | No |
| Bedroom 1 | SSW-009-07 A | Opening 57 | 2400 | 2400 | sliding | 45.0 | WNW | No |
| Bedroom 1 | SSW-011-01 A | Opening 53 | 1800 | 2700 | awning | 10.0 | SSW | No |
| Bedroom 2 | SSW-011-01 A | Opening 53 | 2100 | 1200 | awning | 10.0 | ESE | No |
| Bedroom 2 | SSW-011-01 A | Opening 53 | 2100 | 600 | awning | 10.0 | NNE | No |
| Bedroom 3 | SSW-011-01 A | Opening 52 | 2100 | 2400 | awning | 10.0 | NNE | No |
| Bedroom 3 | ALM-004-01 A | Opening 45 | 2100 | 490 | fixed | 0.0 | WNW | No |
| Bedroom 4 | SSW-011-01 A | Opening 42 | 1800 | 2700 | awning | 10.0 | SSW | No |
| Bedroom 4 | SSW-011-01 A | Opening 51 | 500 | 2400 | awning | 90.0 | WNW | No |
| WIR 1 | SSW-010-07 A | Opening 47 | 300 | 1200 | awning | 10.0 | ESE | No |
| Guest | SSW-011-01 A | Opening 54 | 2400 | 2400 | awning | 10.0 | NNE | No |
| Stairs | SSW-011-01 A | Opening 44 | 2400 | 2650 | awning | 45.0 | SSW | No |
| Stairs | SSW-011-01 A | Opening 48 | 2400 | 1500 | awning | 10.0 | NNE | No |
| WC 1 | SSW-010-07 A | Opening 55 | 1200 | 600 | awning | 10.0 | ESE | No |
| Ensuite 1 | ALM-002-01 A | Opening 46 | 1400 | 1500 | fixed | 0.0 | ESE | No |
| Bath | SSW-010-07 A | Opening 49 | 1200 | 1500 | awning | 10.0 | WNW | No |
| PDR 2 | SSW-010-07 A | Opening 50 | 1200 | 600 | awning | 10.0 | WNW | 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 |
| Velux:VEL-012-01 W | VELUX FCM - Fixed Curb Mount Skylight DG 3mm LoE 366 / 8.5mm Argon Gap / 5.36mm Clear La | 3.97 | 0.27 | 0.26 | 0.28 |

Roof window schedule

| Location | Window ID | Window no. | Opening % | Area (m²) | Orientation | Outdoor shade | Indoor shade |
|----------|--------------------|------------|-----------|-----------|-------------|---------------|--------------|
| Stairs | Velux:VEL-012-01 W | Element 1 | 0.0 | 0.6 | E | 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) | Orientation | Outdoor shade | Diffuser | Skylight shaft reflectance |
|-------------------|-------------|--------------|----------------------------|-----------|-------------|---------------|----------|----------------------------|
| No Data Available | | | | | | | | |

External door schedule

| Location | Height (mm) | Width (mm) | Opening % | Orientation |
|----------|-------------|------------|-----------|-------------|
| Laundry | 1000 | 820 | 100.0 | WNW |
| Entry | 2455 | 1200 | 100.0 | NNE |
| Garage | 2325 | 4810 | 100.0 | NNE |

External wall type

| Wall ID | Wall type | Solar absorptance | Wall shade (colour) | Bulk insulation (R-value) | Reflective wall wrap* |
|---------|--|-------------------|---------------------|--|-----------------------|
| 1 | VAPOUR - Brick Veneer - R2.5 Batts + VP Wrap | 0.5 | Medium | Glass fibre batt: R2.5 (R2.5) | No |
| 2 | STANDARD - Internal Stud Walls | 0.5 | Medium | | No |
| 3 | STANDARD - Brick Veneer | 0.5 | Medium | | No |
| 4 | STANDARD - Double Brick | 0.5 | Medium | | No |
| 5 | VAPOUR - EPS Cladding - R2.5 Batts + VP Wrap | 0.5 | Medium | Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.5) | No |

External wall schedule

| Location | Wall ID | Height (mm) | Width (mm) | Orientation | Horizontal shading feature* maximum projection (mm) | Vertical shading feature (yes/no) |
|-----------------------|---------|-------------|------------|-------------|---|-----------------------------------|
| Kitchen/Family/Dining | 1 | 3066 | 4063 | SSW | 2690 | Yes |



| | | | | | | |
|-----------------------|---|------|------|-----|------|-----|
| Kitchen/Family/Dining | 1 | 3066 | 478 | WNW | 0 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 810 | SSW | 0 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 1922 | ESE | 8389 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 3493 | SSW | 4135 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 1448 | ESE | 4897 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 4924 | SSW | 5015 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 1084 | ESE | 0 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 609 | SSW | 0 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 4265 | ESE | 0 | Yes |
| Kitchen/Family/Dining | 1 | 2550 | 602 | NNE | 0 | Yes |
| Kitchen/Family/Dining | 1 | 3066 | 5461 | WNW | 0 | Yes |
| Laundry | 1 | 3066 | 1880 | WNW | 0 | Yes |
| Pantry | 1 | 3066 | 2430 | WNW | 0 | Yes |
| Pantry | 1 | 3066 | 604 | NNE | 0 | Yes |
| Entry | 1 | 2400 | 1749 | NNE | 1570 | Yes |
| Ensuite 5 | 1 | 2550 | 2218 | ESE | 0 | Yes |
| Sitting | 1 | 2550 | 962 | ESE | 1663 | Yes |
| Sitting | 1 | 2550 | 2564 | NNE | 600 | No |
| Sitting | 1 | 2550 | 959 | WNW | 930 | Yes |
| Sitting | 2 | 2400 | 114 | ESE | 0 | Yes |
| Bedroom 5 | 1 | 2550 | 5482 | ESE | 0 | Yes |
| Bedroom 5 | 1 | 2550 | 1531 | NNE | 0 | Yes |
| Bedroom 5 | 1 | 2550 | 961 | ESE | 0 | Yes |
| Bedroom 5 | 1 | 2550 | 1199 | NNE | 600 | No |
| Bedroom 5 | 1 | 2550 | 961 | WNW | 1341 | Yes |
| Garage | 3 | 2722 | 6020 | WNW | 0 | Yes |
| Garage | 4 | 2550 | 5401 | NNE | 0 | Yes |
| Bedroom 1 | 5 | 2700 | 4259 | WNW | 3512 | Yes |
| Bedroom 1 | 5 | 2700 | 1316 | SSW | 0 | Yes |
| Bedroom 1 | 5 | 2700 | 610 | ESE | 0 | Yes |
| Bedroom 1 | 5 | 2700 | 3816 | SSW | 0 | Yes |
| Bedroom 1 | 5 | 2700 | 3646 | ESE | 0 | Yes |
| Bedroom 2 | 5 | 2700 | 4911 | ESE | 0 | Yes |
| Bedroom 2 | 5 | 2700 | 1616 | NNE | 0 | Yes |
| Bedroom 2 | 5 | 2700 | 961 | ESE | 0 | Yes |
| Bedroom 2 | 5 | 2700 | 1189 | NNE | 0 | Yes |
| Bedroom 2 | 5 | 2700 | 956 | WNW | 0 | Yes |
| Bedroom 3 | 5 | 2700 | 3691 | NNE | 0 | Yes |
| Bedroom 3 | 5 | 2700 | 3649 | WNW | 0 | Yes |
| Bedroom 4 | 5 | 2700 | 3475 | SSW | 0 | Yes |
| Bedroom 4 | 5 | 2700 | 483 | WNW | 0 | Yes |

| | | | | | | |
|-----------|---|------|------|-----|------|-----|
| Bedroom 4 | 5 | 2700 | 812 | SSW | 0 | Yes |
| Bedroom 4 | 5 | 2700 | 1918 | ESE | 2860 | Yes |
| Bedroom 4 | 5 | 2700 | 3759 | WNW | 0 | Yes |
| WIR 1 | 5 | 2700 | 3383 | ESE | 0 | Yes |
| WIR 2 | 5 | 2700 | 1863 | ESE | 0 | Yes |
| Guest | 5 | 2700 | 961 | ESE | 0 | Yes |
| Guest | 5 | 2700 | 2747 | NNE | 600 | Yes |
| Guest | 5 | 2700 | 644 | ESE | 0 | Yes |
| Guest | 5 | 2700 | 914 | NNE | 0 | No |
| Guest | 5 | 2700 | 1620 | WNW | 0 | Yes |
| Guest | 5 | 2700 | 590 | NNE | 0 | Yes |
| WIR 4 | 5 | 2700 | 1477 | WNW | 0 | Yes |
| WIR 3 | 5 | 2700 | 2235 | WNW | 0 | Yes |
| Stairs | 5 | 2700 | 3049 | SSW | 4231 | Yes |
| Stairs | 5 | 2700 | 1639 | NNE | 1575 | Yes |
| WC 1 | 5 | 2700 | 948 | ESE | 0 | Yes |
| Ensuite 1 | 5 | 2700 | 3087 | ESE | 0 | Yes |
| Bath | 5 | 2700 | 2908 | WNW | 0 | Yes |
| PDR 2 | 5 | 2700 | 1630 | WNW | 0 | Yes |

Internal wall type

| Wall ID | Wall type | Area (m ²) | Bulk insulation |
|---------|--|------------------------|-------------------------------|
| 1 | STANDARD - Internal Stud Walls | 295.3 | |
| 2 | STANDARD - Internal Stud Walls -R2.0 Batts | 30.7 | Glass fibre batt: R2.0 (R2.0) |
| 3 | STANDARD - Internal Stud Walls -R1.5 Batts | 36.1 | Glass fibre batt: R1.5 (R1.5) |

Floor type

| Location | Construction | Area (m ²) | Sub-floor ventilation | Added insulation (R-value) | Covering |
|-----------------------|---|------------------------|-----------------------|----------------------------|----------|
| Kitchen/Family/Dining | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 2.2 | Enclosed | R0.0 | Timber |
| Kitchen/Family/Dining | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 78.6 | Enclosed | R0.0 | Timber |
| Kitchen/Family/Dining | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 3.1 | Enclosed | R0.0 | Timber |
| Laundry | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 4.2 | Enclosed | R0.0 | Tiles |
| Laundry | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 0.5 | Enclosed | R0.0 | Tiles |
| Pantry | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 4.4 | Enclosed | R0.0 | Timber |
| Pantry | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 1.5 | Enclosed | R0.0 | Timber |
| PDR 1 | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 3 | Enclosed | R0.0 | Tiles |
| Entry | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 21.1 | Enclosed | R0.0 | Timber |
| Ensuite 5 | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 6.2 | Enclosed | R0.0 | Tiles |
| Linen | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 4.1 | Enclosed | R0.0 | Timber |

| | | | | | |
|--------------|---|------|----------|------|--------|
| Sitting | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 10.9 | Enclosed | R0.0 | Timber |
| Bedroom 5 | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 16.2 | Enclosed | R0.0 | Timber |
| Garage | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 34 | Enclosed | R0.0 | none |
| Garage | FR5 - 225mm waffle pod, 85mm concrete (R0.60) | 1.5 | Enclosed | R0.0 | none |
| Bedroom 1 | FLOOR - Framed External Suspended Floor (R4.0 Insulation) | 22.2 | Elevated | R4.0 | Carpet |
| Bedroom 1 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 3 | Enclosed | R4.0 | Carpet |
| Bedroom 2 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 14.9 | Enclosed | R4.0 | Carpet |
| Bedroom 3 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 13.5 | Enclosed | R4.0 | Carpet |
| Bedroom 4 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 18.1 | Enclosed | R4.0 | Carpet |
| WIR 1 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 14.3 | Enclosed | R4.0 | Carpet |
| WIR 2 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 6.1 | Enclosed | R4.0 | Carpet |
| Guest | FLOOR - Framed External Suspended Floor (R4.0 Insulation) | 1.4 | Elevated | R4.0 | Carpet |
| Guest | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 18.3 | Enclosed | R4.0 | Carpet |
| WIR 4 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 3.7 | Enclosed | R4.0 | Carpet |
| WIR 3 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 5.7 | Enclosed | R4.0 | Carpet |
| Stairs | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 1 | Enclosed | R4.0 | Carpet |
| Stairs | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 55.7 | Enclosed | R4.0 | Carpet |
| Bath Passage | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 9.1 | Enclosed | R4.0 | Carpet |
| WC 1 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 1.7 | Enclosed | R4.0 | Tiles |
| Ensuite 1 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 7.2 | Enclosed | R4.0 | Tiles |
| Ensuite 1 | FLOOR - Framed External Suspended Floor (R4.0 Insulation) | 2.9 | Elevated | R4.0 | Tiles |
| Bath | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 7.4 | Enclosed | R4.0 | Tiles |
| PDR 2 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | 3.7 | Enclosed | R4.0 | Tiles |

Ceiling type

| Location | Construction material/type | Bulk insulation R-value (may include edge batt values) | Reflective wrap* |
|-----------------------|----------------------------|--|------------------|
| Kitchen/Family/Dining | Plasterboard | R6.0 | Yes |

| | | | |
|-----------------------|---|------|-----|
| Kitchen/Family/Dining | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Kitchen/Family/Dining | Plasterboard | R6.0 | Yes |
| Laundry | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Laundry | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Pantry | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Pantry | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Pantry | Plasterboard | R6.0 | Yes |
| PDR 1 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Entry | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Ensuite 5 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Linen | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Sitting | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Bedroom 5 | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Garage | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Garage | FLOOR - Framed Internal Suspended Floor (R4.0 Insulation) | R4.0 | No |
| Bedroom 1 | Plasterboard | R6.0 | Yes |
| Bedroom 1 | Plasterboard | R6.0 | Yes |
| Bedroom 2 | Plasterboard | R6.0 | Yes |
| Bedroom 3 | Plasterboard | R6.0 | Yes |
| Bedroom 4 | Plasterboard | R6.0 | Yes |
| WIR 1 | Plasterboard | R6.0 | Yes |
| WIR 2 | Plasterboard | R6.0 | Yes |
| Guest | Plasterboard | R6.0 | Yes |
| Guest | Plasterboard | R6.0 | Yes |
| WIR 4 | Plasterboard | R6.0 | Yes |
| WIR 3 | Plasterboard | R6.0 | Yes |
| Stairs | Plasterboard | R6.0 | Yes |
| Stairs | Plasterboard | R6.0 | Yes |
| Bath Passage | Plasterboard | R6.0 | Yes |
| WC 1 | Plasterboard | R6.0 | Yes |
| Ensuite 1 | Plasterboard | R6.0 | Yes |
| Ensuite 1 | Plasterboard | R6.0 | Yes |

| | | | |
|-------|--------------|------|-----|
| Bath | Plasterboard | R6.0 | Yes |
| PDR 2 | Plasterboard | R6.0 | Yes |

Ceiling *penetrations**

| Location | Quantity | Type | Diameter (mm) | Sealed/unsealed |
|-----------------------|----------|--------------|---------------|-----------------|
| Kitchen/Family/Dining | 1 | Exhaust Fans | 185 | Sealed |
| PDR 1 | 1 | Exhaust Fans | 250 | Sealed |
| Ensuite 5 | 1 | Exhaust Fans | 250 | Sealed |
| Ensuite 1 | 1 | Exhaust Fans | 250 | Sealed |
| Bath | 1 | Exhaust Fans | 250 | Sealed |
| PDR 2 | 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) | 1.3 | 0.74 | Dark |
| Cont:Attic-Continuous | 1.3 | 0.74 | Dark |



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. |

* Refer to glossary.

| | |
|---|--|
| 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). |