efficient LIVING

NatHERS and BASIX Assessment

The Rubix Collective
Proposed Residential Development

To be built at 128 Elanora Road, Elanora Heights

Issue	File Ref	Description	Author	Date
A	20-0135	NatHERS Thermal Comfort and BASIX Assessment	MP	19/03/2020
B	20-1147	Redesign	AG	27/11/2020

This report has been prepared by Efficient Living Pty Ltd on behalf of our client The Rubix Collective. Efficient Living prepares all reports in accordance with the BASIX Thermal Comfort Protocol and is backed by professional indemnity insurance. This report takes into account our Client's instructions and preferred building inclusions.

If there is a change to this specification during design or construction phases, please contact Efficient Living and quote the above file reference for advice, and to obtain an updated Certificate if required.

Sustainable Building Consultants
p. 02 9970 6181 **e.** admin@efficientliving.com.au
www.efficientliving.com.au

27 November 2020

The Rubix Collective
128 Elanora Road, Elanora Heights

Assessor: Manoela Place
Email: manoela@efficientliving.com.au

License Holder: Tracey Cools
Accreditation Number: HERA10033

BASIX Details:

NatHERS Certificate Number: 0004643268-03

BASIX adjusted conditioned area: 150m^2 | Area adjusted heating load: 47.5 MJ/ m^2/pa

BASIX adjusted un-conditioned area: 4m^2 | Area adjusted cooling load: 22.0 MJ/ m^2/pa

Specification

Heating and cooling loads for the development have been determined using BERS Pro Plus 4.4 thermal comfort simulation software, and assessed under the thermal simulation method of the BASIX Protocol.

The following specification was used to achieve the thermal performance values. Modelling proxies are used at times and if the buildings element details vary the thermal performance specification below shall take precedence.

If there is a change to this specification during design or construction phases, please contact Efficient Living for advice and if required an updated Certificate will be issued.

Floors

Concrete slab on ground with K3 insulation or R1.4 insulation equivalent

Suspended Timber frame with R5.0 insulation (insulation only value)

Timber between levels, no insulation required where habitable rooms are above and below

Timber between garage and habitable rooms with R3.0 insulation (insulation only value)

External Walls

Concrete block walls with R2.7 bulk insulation (insulation value only) to stairs on lower ground

Lightweight cladding on framed walls with Anti-glare foil and R2.7 bulk insulation (insulation value only)

Note: No insulation is required to external garage walls

External Colour: Dark (>0.70)

Walls within dwellings

Plasterboard on studs, no insulation required

Plasterboard on studs, R2.0 insulation between garage and stairs

Glazing Doors/Windows

Performance clear glazing to Living/dining/kitchen

U-value: 5.40 (equal to or lower than) SHGC: 0.49 (±5%)

Single clear glazing to remainder

U-value: 6.7(equal to or lower than) SHGC: 0.70 (±5%)

Given values are AFRC total window system values (glass and frame)

Skylights

Double glazed

Skytube systems (single clear)

Ceilings

Timber ceiling with R5.0 insulation (insulation only value

Ceiling Penetrations

Sealed LED downlights as per NatHERS certificate

Roof

Metal roof with foil backed blanket R1.3 unsulation value

External Colour

Medium (SA 0.58)

Floor coverings

Tiles to bathrooms and laundry, floorboards elsewhere

External Shading

Shading as per stamped drawings

Ventilation

All external doors have weather seals, all exhaust fans and chimneys have dampers, and down lights proposed will have capped fittings

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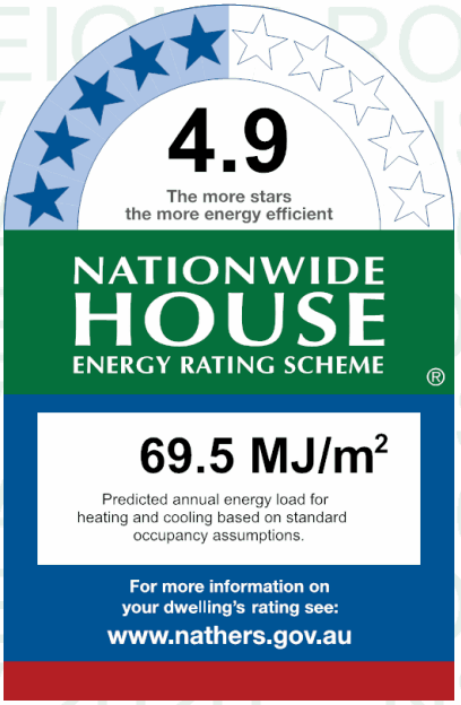
Nationwide House Energy Rating Scheme
NatHERS Certificate No. 0004643268-03

Generated on 27 Nov 2020 using BERS Pro v4.4.0.2 (3.21)



Property

Address	128 Elanora Road , Elanora Heights , NSW , 2101
Lot/DP	1/1237847
NCC Class*	1A
Type	New Dwelling

Plans

Main Plan	20-0135
Prepared by	The Rubix Collective

Construction and environment

Assessed floor area (m^2)*		**Exposure Type**
Conditioned*	150.0	Open
Unconditioned*	43.0	**NatHERS climate zone**
Total	193.0	56
Garage	38.0	

Thermal performance

Heating	Cooling
47.5	**22.0**
MJ/m^2	MJ/m^2

Accredited assessor

Name	Tracey Cools
Business name	Efficient Living
Email	admin@efficientliving.com.au
Phone	02 9970 6181
Accreditation No.	HERA10033

Assessor Accrediting Organisation

HERA

Declaration of interest	None

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 hstar.com.au/QR/Generate?p=SRUuabeYE.
When using either link, ensure you are visiting hstar.com.au

National Construction Code (NCC) requirements

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

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

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

Certificate check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

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

Apartment entrance doors

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

Exposure*

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

Provisional* values

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

Additional notes

Window and glazed door *type and performance*

Default* windows

Window ID	Window Description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
ALM-001-01 A	ALM-001-01 A Aluminium A SG Clear	6.7	0.57	0.57	0.57
ALM-002-01 A	ALM-002-01 A Aluminium B SG Clear	6.7	0.70	0.70	0.70
ALM-002-03 A	ALM-002-03 A Aluminium B SG High Solar Gain Low-E	5.4	0.58	0.58	0.58

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*
Garage 2	ALM-001-01 A	n/a	2140	1000	n/a	90	SE	No
Bedroom 3	ALM-002-01 A	n/a	1200	1810	n/a	45	SW	No
Bedroom 2	ALM-002-01 A	n/a	1200	1810	n/a	45	SW	No
Bathroom	ALM-002-01 A	n/a	2100	900	n/a	90	SE	No
Entry	ALM-002-01 A	n/a	1500	2700	n/a	30	NE	No
Entry	ALM-002-01 A	n/a	1458	1200	n/a	00	NE	No
Kitchen/Living	ALM-002-03 A	n/a	2400	5000	n/a	75	SW	No
Kitchen/Living	ALM-002-03 A	n/a	1030	3440	n/a	45	NW	No
Kitchen/Living	ALM-002-03 A	n/a	2400	4800	n/a	75	NE	No
Kitchen/Living	ALM-002-03 A	n/a	1500	1200	n/a	90	NE	No
Master	ALM-002-01 A	n/a	2100	2700	n/a	60	NW	No
Master	ALM-002-01 A	n/a	1200	3600	n/a	45	NE	No
Master	ALM-002-01 A	n/a	1200	900	n/a	00	NE	No
Ensuite Master	ALM-002-01 A	n/a	2100	900	n/a	90	SE	No
Study	ALM-002-03 A	n/a	1400	2650	n/a	30	SW	No

Roof window *type and performance*

Default* roof windows

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

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Height (mm)	Width (mm)	Orientation	Outdoor shade	Indoor shade
No Data Available								

Skylight *type and performance*

Skylight ID	Skylight description
GEN-04-010a	Tubular single-glazed clear, Timber and Aluminium Frame
GEN-04-008a	Double-glazed clear, Timber and Aluminium Frame

* Refer to glossary.

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m^2)	Orientation	Outdoor shade	Diffuser	Skylight shaft reflectance
Bathroom	GEN-04-010a	n/a	50	0.10	SE	None	No	0.50
Hall/Ldry	GEN-04-010a	n/a	50	0.10	SE	None	No	0.50
Hall/Ldry	GEN-04-010a	n/a	50	0.10	NW	None	No	0.50
Kitchen/Living	GEN-04-008a	n/a	50	0.80	NE	None	No	0.50
Kitchen/Living	GEN-04-008a	n/a	50	0.80	SW	None	No	0.50
Ensuite Master	GEN-04-008a	n/a	50	0.10	SE	None	No	0.50
WC	GEN-04-010a	n/a	50	0.10	SE	None	No	0.50

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Garage 1	2200	2500	90	SW
Garage 2	2200	2500	90	SW
Entry	2040	920	90	NE

External wall *type*

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
EW-1	Concrete block, lined	0.85	Dark	No insulation	No
EW-2	Concrete block, lined	0.50	Medium	No insulation	No
EW-3	Concrete block, lined	0.50	Medium	No insulation	No
EW-4	Weatherboard Cavity Panel Direct Fix	0.85	Dark	Anti-glare foil with bulk no gap R2.7	No
EW-5	Concrete block, lined	0.85	Dark	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 1	EW-1	2400	2795	SW	0	NO
Garage 1	EW-1	2400	400	NW	0	YES
Garage 1	EW-1	2400	400	SW	0	YES
Garage 1	EW-1	2400	3100	NW	0	YES
Garage 1	EW-3	1800	1100	NW	0	NO
Garage 1	EW-1	2400	3690	NE	0	NO
Garage 2	EW-1	2400	3095	NE	0	NO
Garage 2	EW-1	2400	6100	SE	0	NO
Garage 2	EW-1	2400	3095	SW	0	NO
Bedroom 3	EW-4	2400	3095	SE	600	NO

* Refer to glossary.

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 3	EW-4	2400	3395	SW	600	NO
Bedroom 2	EW-4	2400	2495	SW	600	NO
Bedroom 2	EW-4	2400	300	NW	13800	YES
Bedroom 2	EW-4	2400	395	SW	900	YES
Bathroom	EW-4	2400	2990	SE	600	NO
Entry	EW-4	3200	500	NW	8300	YES
Entry	EW-4	3200	5700	NE	2100	YES
Kitchen/Living	EW-4	3200	9495	SW	900	NO
Kitchen/Living	EW-4	3200	6400	NW	600	NO
Kitchen/Living	EW-4	3200	7695	NE	2600	YES
Master	EW-4	2400	5195	NW	600	YES
Master	EW-4	2400	5700	NE	300	NO
Master	EW-4	2400	4695	SE	600	NO
Ensuite Master	EW-4	2400	1590	SE	600	NO
GF Stairs	EW-5	2400	1595	SW	0	YES
GF Stairs	EW-5	2400	2600	NW	0	NO
GF Stairs	EW-5	2400	1095	NE	0	NO
Study	EW-4	3200	3290	SW	900	NO

Internal wall *type*

Wall ID	Wall type	Area (m^2)	Bulk insulation
IW-1 - Cavity wall, direct fix plasterboard, single gap		7.00	Bulk Insulation, No Air Gap R2
IW-2 - Cavity wall, direct fix plasterboard, single gap		149.00	No insulation

Floor *type*

Location	Construction	Area (m^2)	Sub-floor ventilation	Added insulation (R-value)	Covering
Garage 1	Concrete Slab on Ground 100mm	19.70	None	Bulk Insulation in Contact with Floor R1.4	Bare
Garage 2	Concrete Slab on Ground 100mm	18.60	None	Bulk Insulation in Contact with Floor R1.4	Bare
Bedroom 3/Garage 1	Timber Above Plasterboard 19mm	0.50		Bulk Insulation R3	Cork Tiles or Parquetry 8mm
Bedroom 3/Garage 2	Timber Above Plasterboard 19mm	9.10		Bulk Insulation R3	Cork Tiles or Parquetry 8mm
Bedroom 2/Garage 1	Timber Above Plasterboard 19mm	10.10		Bulk Insulation R3	Cork Tiles or Parquetry 8mm
Bedroom 2/Garage 2	Timber Above Plasterboard 19mm	0.70		Bulk Insulation R3	Cork Tiles or Parquetry 8mm
Bathroom /Garage 2	Timber Above Plasterboard 19mm	4.80		Bulk Insulation R3	Ceramic Tiles 8mm
Hall/Ldry/Garage 1	Timber Above Plasterboard 19mm	8.20		Bulk Insulation R3	Cork Tiles or Parquetry 8mm

* Refer to glossary.

Location	Construction	Area (m)	Sub-floor ventilation	Added insulation (R-value)	Covering
Hall/Ldry/Garage 2	Timber Above Plasterboard 19mm	1.20		Bulk Insulation R3	Cork Tiles or Parquetry 8mm
Hall/Ldry/GF Stairs	Timber Above Plasterboard 19mm	3.20		No Insulation	Cork Tiles or Parquetry 8mm
Entry	Suspended Timber Floor 19mm	12.40	Totally Open	Bulk Insulation in Contact with Floor R5	Cork Tiles or Parquetry 8mm
Kitchen/Living	Suspended Timber Floor 19mm	56.50	Totally Open	Bulk Insulation in Contact with Floor R5	Cork Tiles or Parquetry 8mm
Master	Suspended Timber Floor 19mm	27.00	Totally Open	Bulk Insulation in Contact with Floor R5	Cork Tiles or Parquetry 8mm
Ensuite Master	Suspended Timber Floor 19mm	4.90	Totally Open	Bulk Insulation in Contact with Floor R5	Cork Tiles or Parquetry 8mm
GF Stairs	Concrete Slab on Ground 100mm	3.30	None	Bulk Insulation in Contact with Floor R1.4	Carpet 10mm
Lin.	Suspended Timber Floor 19mm	2.00	Totally Open	Bulk Insulation in Contact with Floor R5	Cork Tiles or Parquetry 8mm
WC/Garage 2	Timber Above Plasterboard 19mm	2.10		Bulk Insulation R3	Ceramic Tiles 8mm
Study	Suspended Timber Floor 19mm	11.70	Totally Open	Bulk Insulation in Contact with Floor R5	Cork Tiles or Parquetry 8mm

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Garage 1	Timber Above Plasterboard	Bulk Insulation R3	No
Garage 2	Timber Above Plasterboard	Bulk Insulation R3	No
Bedroom 3	Plasterboard	Bulk Insulation R5	No
Bedroom 2	Plasterboard	Bulk Insulation R5	No
Bathroom	Plasterboard	Bulk Insulation R5	No
Hall/Ldry	Plasterboard	Bulk Insulation R5	No
Entry	Plasterboard	Bulk Insulation R5	No
Kitchen/Living	Timber	Bulk Insulation R5	No
Master	Timber	Bulk Insulation R5	No
Ensuite Master	Plasterboard	Bulk Insulation R5	No
GF Stairs	Timber Above Plasterboard	No Insulation	No
Lin.	Plasterboard	Bulk Insulation R5	No
WC	Plasterboard	Bulk Insulation R5	No
Study	Plasterboard	Bulk Insulation R5	No

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm^2)	Sealed/unsealed
Garage 1	3	Downlights - LED	150	Sealed
Garage 2	2	Downlights - LED	150	Sealed
Bedroom 3	4	Downlights - LED	150	Sealed
Bedroom 2	4	Downlights - LED	150	Sealed

* Refer to glossary.

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Bathroom	2	Downlights - LED	150	Sealed
Bathroom	1	Exhaust Fans	300	Sealed
Hall/Ldry	3	Downlights - LED	150	Sealed
Hall/Ldry	1	Exhaust Fans	300	Sealed
Entry	4	Downlights - LED	150	Sealed
Kitchen/Living	11	Downlights - LED	150	Sealed
Kitchen/Living	1	Exhaust Fans	300	Sealed
Master	6	Downlights - LED	150	Sealed
Ensuite Master	2	Downlights - LED	150	Sealed
Ensuite Master	1	Exhaust Fans	300	Sealed
GF Stairs	2	Downlights - LED	150	Sealed
Lin.	1	Downlights - LED	450	Sealed
WC	1	Downlights - LED	450	Sealed
WC	1	Exhaust Fans	300	Sealed
Study	4	Downlights - LED	450	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Corrugated Iron	Bulk, Reflective Side Down, Anti-glare Up R1.3	0.58	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).

BASIX® Certificate

Building Sustainability Index www.basix.nsw.gov.au

Single Dwelling

Certificate number: 1082706S_04

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at www.basix.nsw.gov.au

Secretary
Date of issue: Friday, 27 November 2020
To be valid, this certificate must be lodged within 3 months of the date of issue.

NSW GOVERNMENT | Planning, Industry & Environment

Project summary	
Project name	128 Elanora Road, Elanora Heights_04
Street address	128 Elanora Road Elanora Heights 2101
Local Government Area	Northern Beaches Council
Plan type and plan number	deposited 1237847
Lot no.	1
Section no.	-
Project type	separate dwelling house
No. of bedrooms	3

Project score		
Water	✔ 40	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 57	Target 50

Certificate Prepared by
Name / Company Name: Efficient Living Pty Ltd
ABN (if applicable): 82116346082

Description of project

Project address	
Project name	128 Elanora Road, Elanora Heights_04
Street address	128 Elanora Road Elanora Heights 2101
Local Government Area	Northern Beaches Council
Plan type and plan number	Deposited Plan 1237847
Lot no.	1
Section no.	-
Project type	
Project type	separate dwelling house
No. of bedrooms	3
Site details	
Site area (m²)	763
Roof area (m²)	230
Conditioned floor area (m2)	150.0
Unconditioned floor area (m2)	4.0
Total area of garden and lawn (m2)	135

Assessor details and thermal loads		
Assessor number	HERA10033	
Certificate number	0004643268-02	
Climate zone	56	
Area adjusted cooling load (MJ/m².year)	20	
Area adjusted heating load (MJ/m².year)	41	
Ceiling fan in at least one bedroom	No	
Ceiling fan in at least one living room or other conditioned area	No	
Project score		
Water	✔ 40	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 57	Target 50

Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

Water Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Fixtures			
The applicant must install showerheads with a minimum rating of 3 star (> 7.5 but <= 9 L/min) in all showers in the development.		✔	✔
The applicant must install a toilet flushing system with a minimum rating of 4 star in each toilet in the development.		✔	✔
The applicant must install taps with a minimum rating of 4 star in the kitchen in the development.		✔	
The applicant must install basin taps with a minimum rating of 4 star in each bathroom in the development.		✔	
Alternative water			
Rainwater tank			
The applicant must install a rainwater tank of at least 2000 litres on the site. This rainwater tank must meet, and be installed in accordance with, the requirements of all applicable regulatory authorities.	✔	✔	✔
The applicant must configure the rainwater tank to collect rain runoff from at least 80 square metres of the roof area of the development (excluding the area of the roof which drains to any stormwater tank or private dam).		✔	✔
The applicant must connect the rainwater tank to: • all toilets in the development		✔	✔
• the cold water tap that supplies each clothes washer in the development		✔	✔
• at least one outdoor tap in the development (Note: NSW Health does not recommend that rainwater be used for human consumption in areas with potable water supply.)		✔	✔

Thermal Comfort Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Simulation Method			
The applicant must attach the certificate referred to under "Assessor Details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for an occupation certificate for the proposed development.			
The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX certificate, including the Cooling and Heating loads shown on the front page of this certificate.			
The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Assessor Certificate requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor to certify that this is the case. The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.	✔	✔	✔
The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✔	✔
The applicant must construct the floors and walls of the dwelling in accordance with the specifications listed in the table below.	✔	✔	✔

Floor and wall construction	Area
floor - concrete slab on ground	3.0 square metres
floor - suspended floor/open subfloor	117.0 square metres
floor - suspended floor above garage	All or part of floor area

Energy Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Hot water			
The applicant must install the following hot water system in the development, or a system with a higher energy rating: electric heat pump with a performance of 26 to 30 STCs or better.	✔	✔	✔
Cooling system			
The applicant must install the following cooling system, or a system with a higher energy rating, in at least 1 living area: 3-phase airconditioning; Energy rating: EER 2.5 - 3.0		✔	✔
The applicant must install the following cooling system, or a system with a higher energy rating, in at least 1 bedroom: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✔	✔
Heating system			
The applicant must install the following heating system, or a system with a higher energy rating, in at least 1 living area: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✔	✔
The applicant must install the following heating system, or a system with a higher energy rating, in at least 1 bedroom: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✔	✔
Ventilation			
The applicant must install the following exhaust systems in the development:			
At least 1 Bathroom: individual fan, ducted to façade or roof; Operation control: manual switch on/off		✔	✔
Kitchen: individual fan, ducted to façade or roof; Operation control: manual switch on/off		✔	✔
Laundry: individual fan, ducted to façade or roof; Operation control: manual switch on/off		✔	✔
Artificial lighting			
The applicant must ensure that the "primary type of artificial lighting" is fluorescent or light emitting diode (LED) lighting in each of the following rooms, and where the word "dedicated" appears, the fittings for those lights must only be capable of accepting fluorescent or light emitting diode (LED) lamps:			
• at least 4 of the bedrooms / study;		✔	✔
• at least 3 of the living / dining rooms;		✔	✔
• the kitchen;		✔	✔

Energy Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
• all bathrooms/toilets; • the laundry; • all hallways;		✔ ✔ ✔	✔ ✔ ✔
Natural lighting			
The applicant must install a window and/or skylight in the kitchen of the dwelling for natural lighting.	✔	✔	✔
The applicant must install a window and/or skylight in 2 bathroom(s)/toilet(s) in the development for natural lighting.	✔	✔	✔
Alternative energy			
The applicant must install a photovoltaic system with the capacity to generate at least 1 peak kilowatts of electricity as part of the development. The applicant must connect this system to the development's electrical system.	✔	✔	✔
Other			
The applicant must install a fixed outdoor clothes drying line as part of the development.		✔	

Legend
In these commitments, "applicant" means the person carrying out the development.
Commitments identified with a ✔ in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
Commitments identified with a ✔ in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
Commitments identified with a ✔ in the "Certifier check" column must be certified by a certifying authority as having been fulfilled, before a final occupation certificate(either interim or final) for the development may be issued.