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NCC 3.12 Energy Efficiency Assessment

1030 Nepean Highway, Moorabbin, VIC 3189

File Name:	NEP-1030-19
Report Date:	05-02-2021
Class:	1

General insulation and glazing requirements for compliance:

- Weather Seal Entry Door
- Party wall insulation to reach R2.7 on each side (total R5.4)
- Ceiling insulation to reach R3.5 + R1.3 Anticon 60 blanket
- All windows and glazed doors to be double glazed with the following specifications:
- Fixed windows (W101 & W102): 2.35 and SHGC 0.55
- Balance of fixed windows: U 2.74 and SHGC 0.53
- Awning windows: U 3.38 and SHGC 0.44
- Double hung windows: U 4.51 and SHGC 0.51

Upgraded insulation and glazing requirements for individual units beyond items listed above:

Unit U1-Rev1

- Wall Insulation to reach R2.7 + Foil
- Internal boundary wall separating the garage from habitable rooms insulation to reach R2.7
- Intermediate floor insulation to reach R2.7
- R2.0 Soundscreen acoustic insulation to the following internal walls:
- • All walls surrounding the laundry
- • Between the study and the hallway
- • All walls surrounding the ensuite
- • All walls surrounding the bathroom
- • Between bedroom 3 and bedroom 4
- Skylights to be double glazed Max U4.22 and SHGC 0.72
- Sliding doors to be double glazed Max U3.10 and SHGC 0.49

Unit U2-Rev1

- Wall Insulation to reach R2.5 + Foil
- R2.0 Soundscreen acoustic insulation to the following internal walls:
- • All walls surrounding the laundry
- • All walls surrounding the powder

iCheck Building Surveyors & Consultants

AMENDED BUILDING PERMIT DOCUMENTATION

Date 11/03/2021

Permit No. 7677200805797

Relevant Building Surveyor

Mitroklis Jim Menelaou - BSU38261

INSPECTION BOOKINGS: 8555 9831

- • All walls surrounding the ensuite
- • All walls surrounding the bathroom
- • Between bedroom 3 and bedroom 4
- Sliding doors to be double glazed Max U2.73 and SHGC 0.53
- Entry skylight to be double glazed Max U3.97 and SHGC 0.27
- Balance of skylights to be double glazed Max U4.22 and SHGC 0.72

Additional Provisions as per NCC 3.12.0 (a)(i) and NCC 3.12.0 (b):

No downlights have been assessed within this energy report. The installation of downlights will negatively affect the energy report due to a loss of ceiling insulation as perNCC 3.12 Table 3.12.1.1b.

Insulation is to be installed in accordance with the provisions outlined in NCC 3.12.1.1

All construction elements are to be sealed in accordance with the provisions outlined in NCC 3.12.3

A hot water supply system must be designed and installed in accordance with Section 8 of AS/NZS 3500.4 or clause 3.38 of AS/NZS 3500.5. Installation to be in accordance with NCC 3.12.5.

Central heating water piping and heating/cooling ductwork must use thermal insulation material in accordance with AS/NZS 4859.1. Installation to be in accordance with NCC 3.12.5.

All residential lighting is subject to meeting performance levels outlined in NCC 3.12.5.5.

Assessment Notes:

Construction drawings are assessed based on the requirements outlined in the National Construction Code Part 3.12.0.1 and NATHERS Technical Note 2

The energy assessment has been completed using : revised construction drawings supplied by Kaya Constructions on the 24-11-2020

Any alteration to the construction drawings or alterations during/post construction will render the energy efficiency assessment void.

All results are based on a fixed assumption that a minimum of holland blinds will be installed by the owner upon a Certificate of Occupancy being issued. All other window furnishings cannot be simulated.

If no floor coverings have been defined within the supplied documentation floor tiles will be assessed within the kitchen and wet areas with carpet to the balance of the dwelling.

If no wall and roof colours have been defined within the supplied documentation then a light coloured roof and medium coloured walls will be assessed as per NATHERS Technical Note 2.

Typical solar absorptance values are located within NCC 3.12.1.2

Rainwater tanks or solar hot water units do not form part of a 6 star energy report. Please consult NCC V2.6.1a or your registered building surveyor for further information.

Default Clause 10.12 from NATHERS Technical Note 2 will be adopted if no neighbouring building information is documented on the assessed drawings.

Nationwide House Energy Rating Scheme
NatHERS Certificate No. 0VX5YX8FFL

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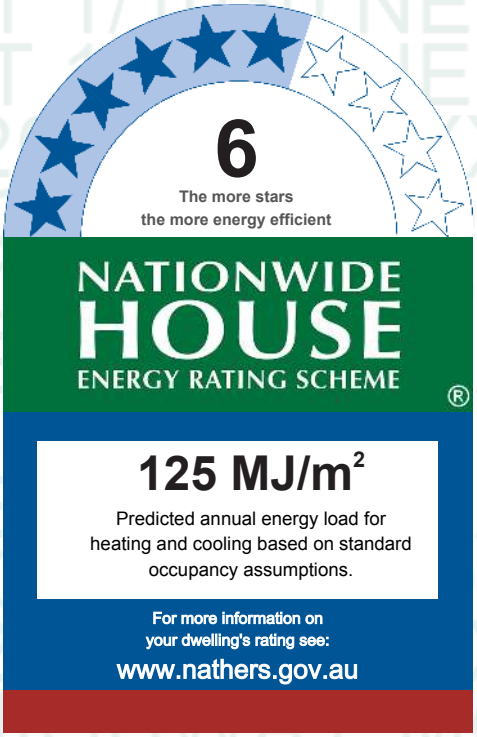

Property

Address	Unit 1/1030 Nepean Highway, Moorabbin, VIC, 3189
Lot/DP	-
NCC Class*	Class 1a
Type	New Home

Plans

Main plan	-
Prepared by	-

Construction and environment

Assessed floor area (m²)*	
Conditioned*	216.5
Unconditioned*	0
Total	241.1
Garage	24.6

Exposure type
suburban

NatHERS climate zone
62, Moorabbin

Thermal performance

Heating	Cooling
89.5 MJ/m²	**35.5** MJ/m²

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

Accredited assessor

Name	Sharelle Haines
Business name	EnergyLab
Email	admin@energylab.com.au
Phone	1300033343
Accreditation No.	DMN/11/2078

Assessor Accrediting Organisation
DMN

Declaration of interest Declaration completed: no conflicts

Verification

To verify this certificate, scan the QR code or visit https://www.fr5.com.au/QRCodeLanding?PublicId=0VX5YX8FFL When using either link, ensure you are visiting www.FR5.com.au.

National Construction Code (NCC) requirements

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

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

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

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

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

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

				Substitution tolerance ranges	
Window ID	**Window description**	**Maximum U-value***	**SHGC***	SHGC lower limit	SHGC upper limit
ATB-004-03 B	Al Thermally Broken B DG Air Fill High Solar Gain low-E -Clear	3.1	0.49	0.47	0.51

Custom* windows

				Substitution tolerance ranges	
Window ID	**Window description**	**Maximum U-value***	**SHGC***	SHGC lower limit	SHGC upper limit
BRD-032-54 A	ESS Hinged Door (100mm) DG 4mmClr_10Ar_4mmOptitherm	3.22	0.45	0.43	0.47
ECO-115-04 A	EcoEcoTech Aluminium Fixed Window DG 4ET-12Ar-4	2.35	0.55	0.52	0.58
AWS-071-25 A	RES SERIES 616 FIXED WINDOW DG FGIOptEmaClr_4mm_16Ar_4mm	2.74	0.53	0.5	0.56
BRD-113_63 A	ESS Awning 52 DG FGIOptEma+Clr_4mm_16Ar_4mm	3.38	0.44	0.42	0.46

Window and glazed door *Schedule*

Location	Window ID	Window no.	Height (mm)	Width (mm)	Window type	Opening %	Orientation	Window shading device*
Study	BRD-032-54 A	D.106	2400	900	casement	90.0	NE	No
Entry	ECO-115-04 A	W.101	600	1900	fixed	0.0	SE	No
Hallway	BRD-032-54 A	D111	2340	900	casement	90.0	NW	No
Hallway	AWS-071-25 A	W.102	2400	3000	fixed	0.0	NW	No
Kitchen/Living/-Dining	ATB-004-03 B	D115	2400	4000	sliding	60.0	NW	No
Kitchen/Living/-Dining	BRD-113_63 A	W.104	750	2400	awning	45.0	NW	No
Kitchen/Living/-Dining	ATB-004-03 B	D116	2400	4000	sliding	60.0	SW	No
Kitchen/Living/-Dining	AWS-071-25 A	W.103	2400	930	fixed	0.0	NE	No
Master Bedroom	BRD-113_63 A	W.112	750	2400	awning	45.0	NW	No
Master Bedroom	BRD-113_63 A	D126	2450	2400	awning	60.0	SW	No
Bedroom 3	BRD-113_63 A	W.106	2100	600	awning	90.0	NE	No
Bedroom 3	BRD-113_63 A	W.107	2100	600	awning	90.0	NE	No
Bedroom 3	BRD-113_63 A	W.108	2100	600	awning	60.0	NE	No
Bedroom 4	BRD-113_63 A	W.110	750	2400	awning	45.0	NW	No
Bedroom 4	BRD-113_63 A	W.109	2400	2400	awning	60.0	NE	No
Retreat	ECO-115-04 A	W.102	750	3000	fixed	0.0	NW	No
Ensuite	BRD-113_63 A	W.111	700	3900	awning	30.0	NW	No

Roof window *type and performance value*

Default* roof windows

Window ID	Window description	Maximum U-value*	SHGC*	Substitution tolerance ranges	
				SHGC lower limit	SHGC upper limit
DEFAULTS:DG-Generic-02 A	Clear Al DG DEFAULT ROOF WINDOW System 02	4.22	0.72	0.68	0.76

Custom* roof windows

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

Roof window *schedule*

Location	Window ID	Window no.	Opening %	Area (m²)	Orientation	Outdoor shade	Indoor shade
Master WIR	DEFAULTS:DG-Generic-02 A	Element 1	0.0	0.5	NW	None	None
Bathroom	DEFAULTS:DG-Generic-02 A	Element 2	0.0	2	NW	None	None

* Refer to glossary.

Skylight *type and performance*

Skylight ID	Skylight description
No Data Available	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m²)	Orient-ation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Garage	2340	820	100.0	SW
Garage	2400	3000	100.0	NE
Entry	2700	900	100.0	NE

External wall *type*

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	FR5 - Concrete Block Solid/Core Filled	0.5	Medium		No
2	FR5 - Fibro Clad Framed	0.5	Medium		No
3	AAC75 - AAC 75mm Panel - R0.0	0.5	Medium		No
4	AAC75 - AAC 75mm Panel - R2.7F	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)	No
5	PW - Hebel 75	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7);Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)	No
6	FC - Fibro Clad Framed - R2.7F	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)	No
7	Int - Glass area	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)
Garage	1	2800	7035	NW	0	No
Garage	2	2800	1745	SW	0	Yes
Garage	2	2800	699	SW	2761	Yes
Garage	3	2800	3497	NE	2026	Yes
Study	4	2750	1561	NE	0	Yes
Study	5	2750	1080	SW	0	No
Study	5	2750	3995	SE	0	No
WIR	5	2750	1503	SE	0	No
Entry	6	2920	611	NW	2223	Yes

* Refer to glossary.

Entry	6	2920	222	NE	2069	Yes
Entry	6	2920	2626	SE	596	Yes
Entry	6	2920	2891	NE	1493	Yes
Hallway	6	2750	2767	NW	561	Yes
Hallway	6	2750	3281	NW	0	Yes
Pantry	5	2750	1446	SE	0	No
Ensuite	5	2750	1895	SE	0	No
Laundry	5	2750	1805	SE	0	No
Kitchen/Living/Dining	6	2750	5543	NW	0	No
Kitchen/Living/Dining	7	2400	2370	NE	0	No
Kitchen/Living/Dining	6	2750	4127	NW	191	No
Kitchen/Living/Dining	6	2750	6101	SW	2490	Yes
Kitchen/Living/Dining	5	2750	9670	SE	0	No
Kitchen/Living/Dining	6	2750	1364	NE	0	Yes
Master Bedroom	6	2750	932	SE	0	Yes
Master Bedroom	5	2750	4067	SE	0	No
Master Bedroom	6	2750	5015	NW	355	Yes
Master Bedroom	6	2750	4421	SW	1033	Yes
Master WIR	5	2750	3606	SE	0	No
Bedroom 3	4	2750	3269	NE	0	Yes
Bedroom 3	5	2750	727	SE	0	No
Bedroom 3	5	2750	1085	SW	0	No
Bedroom 3	5	2750	2988	SE	0	No
Bedroom 3	5	2750	1032	SE	0	No
Bedroom 4	6	2750	4056	NW	0	No
Bedroom 4	6	2750	1137	SE	0	Yes
Bedroom 4	6	2750	3222	NE	0	No
WIR 4	6	2750	749	SW	0	Yes
WIR 4	6	2750	1313	NW	0	No
Linen	4	2750	1610	NW	0	Yes
Retreat	4	2750	5488	NW	0	Yes
Retreat	5	2750	3003	SE	0	No
Ensuite	4	2750	3842	NW	0	No
Ensuite	4	2750	835	SW	0	Yes
Ensuite	4	2750	534	NE	0	Yes
Bathroom	5	2750	3950	SE	0	No

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	83	
2	FR5 - Internal Plasterboard Stud Wall	23.1	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)
3	Int - Internal Stud Wall - R2.0F	95.4	Glass fibre batt: R2.0 (R2.0)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Garage	CSOG - Concrete Slab on Ground	10.9	Enclosed	R0.0	none
Garage	CSOG - Concrete Slab on Ground	13.7	Enclosed	R0.0	none
Study	CSOG - Concrete Slab on Ground	13.5	Enclosed	R0.0	Timber
WIR	CSOG - Concrete Slab on Ground	3.5	Enclosed	R0.0	Timber
Entry	CSOG - Concrete Slab on Ground	1.6	Enclosed	R0.0	Tiles
Entry	CSOG - Concrete Slab on Ground	6.5	Enclosed	R0.0	Tiles
Hallway	CSOG - Concrete Slab on Ground	19.9	Enclosed	R0.0	Timber
Pantry	CSOG - Concrete Slab on Ground	3.4	Enclosed	R0.0	Timber
Ensuite	CSOG - Concrete Slab on Ground	4.4	Enclosed	R0.0	Tiles
Laundry	CSOG - Concrete Slab on Ground	4.2	Enclosed	R0.0	Tiles
Kitchen/Living/D-ining	CSOG - Concrete Slab on Ground	47.4	Enclosed	R0.0	Timber
Kitchen/Living/D-ining	CSOG - Concrete Slab on Ground	11.6	Enclosed	R0.0	Timber
Master Bedroom	INTFLR - Intermediate Floor R2.5	26.5	Enclosed	R2.7	Timber
Master WIR	INTFLR - Intermediate Floor R2.5	5.6	Enclosed	R2.7	Timber
Bedroom 3	INTFLR - Intermediate Floor R2.5	14.7	Enclosed	R2.7	Timber
Bedroom 4	INTFLR - Intermediate Floor R2.5	13	Enclosed	R2.7	Timber
WIR 4	INTFLR - Intermediate Floor R2.5	2.4	Enclosed	R2.7	Timber
Linen	INTFLR - Intermediate Floor R2.5	1.7	Enclosed	R2.7	Timber
Retreat	INTFLR - Intermediate Floor R2.5	23.7	Enclosed	R2.7	Timber
Ensuite	INTFLR - Intermediate Floor R2.5	9.4	Enclosed	R2.7	Tiles
Bathroom	INTFLR - Intermediate Floor R2.5	9.1	Enclosed	R2.7	Tiles

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Garage	INTFLR - Intermediate Floor R2.5	R2.7	No
Garage	Plasterboard	R0.0	Yes
Study	INTFLR - Intermediate Floor R2.5	R2.7	No
WIR	INTFLR - Intermediate Floor R2.5	R2.7	No
Entry	INTFLR - Intermediate Floor R2.5	R2.7	No
Entry	Plasterboard	R4.8	Yes
Hallway	INTFLR - Intermediate Floor R2.5	R2.7	No
Pantry	INTFLR - Intermediate Floor R2.5	R2.7	No
Ensuite	INTFLR - Intermediate Floor R2.5	R2.7	No
Laundry	INTFLR - Intermediate Floor R2.5	R2.7	No
Kitchen/Living/D-ining	INTFLR - Intermediate Floor R2.5	R2.7	No

* Refer to glossary.

Kitchen/Living/D-ining	Plasterboard	R4.8	Yes
Master Bedroom	Plasterboard	R4.8	Yes
Master WIR	Plasterboard	R4.8	Yes
Bedroom 3	Plasterboard	R4.8	Yes
Bedroom 4	Plasterboard	R4.8	Yes
WIR 4	Plasterboard	R4.8	Yes
Linen	Plasterboard	R4.8	Yes
Retreat	Plasterboard	R4.8	Yes
Ensuite	Plasterboard	R4.8	Yes
Bathroom	Plasterboard	R4.8	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Ensuite	1	Exhaust Fans	280	Sealed
Laundry	1	Exhaust Fans	280	Sealed
Kitchen/Living/Dining	1	Heater Flues	200	Unsealed
Kitchen/Living/Dining	1	Exhaust Fans	150	Sealed
Ensuite	1	Exhaust Fans	280	Sealed
Bathroom	1	Exhaust Fans	280	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.5	Medium

* Refer to glossary.

Explanatory Notes

About this report

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

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

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

Accredited assessors

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

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

AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

Disclaimer

The format of the NatHERS Certificate was developed by the NatHERSAdministrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, indoor air temperature and local climate.

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

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
Ceiling penetrations	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
Conditioned	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category - protected	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
Horizontal shading feature	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

Nationwide House Energy Rating Scheme
NatHERS Certificate No. GJXQOBM6KI

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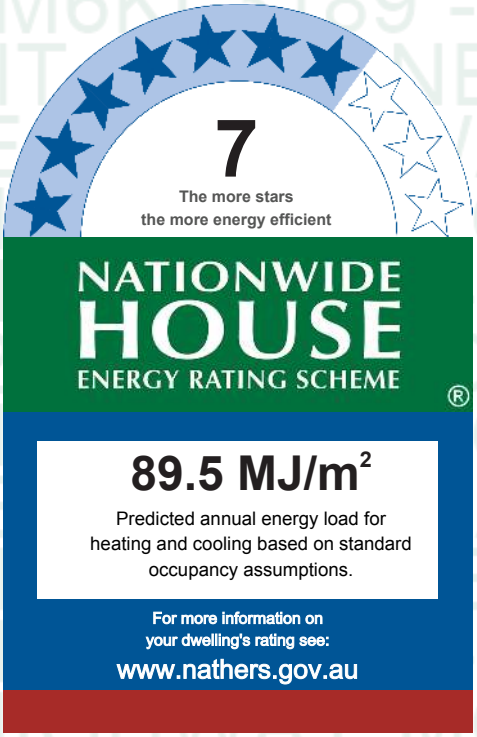

Property

Address	Unit 2/1030 Nepean Highway, Moorabbin, VIC, 3189
Lot/DP	-
NCC Class*	Class 1a
Type	New Home

Plans

Main plan	-
Prepared by	-

Construction and environment

Assessed floor area (m²)*	
Conditioned*	167.4
Unconditioned*	14.4
Total	181.8
Garage	-

Exposure type
suburban

NatHERS climate zone
62, Moorabbin

Thermal performance

Heating	**Cooling**
74.1 MJ/m²	**15.4** MJ/m²

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

Accredited assessor

Name	Sharelle Haines
Business name	EnergyLab
Email	admin@energylab.com.au
Phone	1300033343
Accreditation No.	DMN/11/2078
Assessor Accrediting Organisation	DMN
Declaration of interest	Declaration completed: no conflicts

Verification

To verify this certificate, scan the QR code or visit https://www.fr5.com.au/QRCodeLanding?PublicId=GJXQOBM6KI When using either link, ensure you are visiting www.FR5.com.au.

National Construction Code (NCC) requirements

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

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

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

Certificate Check

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

Genuine certificate

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

Ceiling penetrations*

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

Windows

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

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

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

Custom* windows

				Substitution tolerance ranges	
Window ID	**Window description**	**Maximum U-value***	**SHGC***	SHGC lower limit	SHGC upper limit
BRD-113_63 A	ESS Awning 52 DG FGIOptEma+Clr_4mm_16Ar_4mm	3.38	0.44	0.42	0.46
BRD-032-54 A	ESS Hinged Door (100mm) DG 4mmClr_10Ar_4mmOptitherm	3.22	0.45	0.43	0.47
BRD-141-31 A	Signature Sliding Stacking Door DG 4mmClr-10Ar-4mmOptitherm	2.73	0.53	0.5	0.56
VAN-002-25 A	613 Magnum Al Double Hung DG 4/10/4	4.51	0.51	0.48	0.54

Window and glazed door *Schedule*

Location	**Window ID**	**Window no.**	**Height (mm)**	**Width (mm)**	**Window type**	**Opening %**	**Orientation**	**Window shading device***

* Refer to glossary.

Bedroom 1	BRD-113_63 A	W.205	2400	900	awning	90.0	NE	No
Bedroom 1	BRD-113_63 A	W.204	600	2400	awning	45.0	SE	No
Laundry	BRD-032-54 A	D.210	2400	900	casement	90.0	SE	No
Ensuite	BRD-113_63 A	W.203	1800	600	awning	90.0	SE	No
Kitchen/Living/-Dining	BRD-141-31 A	D.212	2400	4500	sliding	60.0	SW	No
Kitchen/Living/-Dining	BRD-113_63 A	W.201	2100	3000	awning	45.0	SE	No
Kitchen/Living/-Dining	BRD-113_63 A	W.202	1300	1800	awning	45.0	SE	No
Bedroom 2	BRD-113_63 A	W.211	750	2350	awning	45.0	SE	No
Bedroom 2	BRD-113_63 A	W.212	2400	2400	awning	60.0	NE	No
Bedroom 3	BRD-113_63 A	W.208	750	2400	awning	45.0	SE	No
Bedroom 4	BRD-113_63 A	W.206	1500	2400	awning	45.0	SW	No
Bedroom 4	BRD-113_63 A	W.207	750	2400	awning	45.0	SE	No
Study	VAN-002-25 A	W.209	1500	600	double_hung	45.0	SE	No
Bath	BRD-113_63 A	W.210	700	3790	awning	35.0	SE	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
DEFAULTS:DG-Generic-02 A	Clear AI DG DEFAULT ROOF WINDOW System 02	4.22	0.72	0.68	0.76

Custom* roof windows

				Substitution tolerance ranges	
Window ID	**Window description**	**Maximum U-value***	**SHGC***	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**
Entry	Velux:VEL-012-01 W	Element 5	0.0	0.4	SE	None	None
Kitchen/Living/Din- ing	DEFAULTS:DG-Generic-02 A	Element 3	0.0	1	N	None	None
Kitchen/Living/Din- ing	DEFAULTS:DG-Generic-02 A	Element 7	0.0	1	N	None	None
Kitchen/Living/Din- ing	DEFAULTS:DG-Generic-02 A	Element 9	0.0	1	N	None	None
Upper Foyer	DEFAULTS:DG-Generic-02 A	Element 4	0.0	0.8	SE	None	None

* Refer to glossary.

Skylight *type and performance*

Skylight ID	Skylight description
No Data Available	

Skylight *schedule*

Location	Skylight ID	Skylight No.	Skylight shaft length (mm)	Area (m²)	Orient-ation	Outdoor shade	Diffuser	Skylight shaft reflectance
No Data Available								

External door *schedule*

Location	Height (mm)	Width (mm)	Opening %	Orientation
Entry	2740	980	100.0	NE

External wall *type*

Wall ID	Wall type	Solar absorptance	Wall shade (colour)	Bulk insulation (R-value)	Reflective wall wrap*
1	FC - Fibro Clad Framed - R2.7F	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)	No
2	PW - Hebel 75	0.5	Medium	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7);Glass fibre batt (k = 0.044 density = 12 kg/m3) (R2.7)	No
3	FC - Fibro Clad Framed - R2.5F	0.5	Medium	Glass fibre batt: R2.5 (R2.5)	No
4	AAC75 - AAC 75mm Panel - R2.5F	0.5	Medium	Glass fibre batt: R2.5 (R2.5)	No

External wall *schedule*

Location	Wall ID	Height (mm)	Width (mm)	Orientation	Horizontal shading feature* maximum projection (mm)	Vertical shading feature (yes/no)
Bedroom 1	1	2750	2312	NE	5694	Yes
Bedroom 1	1	2750	4123	SE	0	No
Entry	2	2920	3967	NW	0	No
Entry	1	2920	4102	SE	2359	Yes
Entry	1	2920	2706	NE	1490	Yes
Hallway	2	2750	3891	NW	0	No
Hallway	2	2750	1088	NE	0	No
Linen	2	2750	1822	NW	0	No
Laundry	3	2750	1701	SE	0	No
Powder	2	2750	2502	NW	0	No
Ensuite	3	2750	2260	SE	0	No
Kitchen/Living/Dining	3	2750	6101	SW	0	No
Kitchen/Living/Dining	3	2750	8935	SE	0	No
Kitchen/Living/Dining	2	2750	8936	NW	0	No

* Refer to glossary.

Bedroom 2	2	2750	3258	NW	0	No
Bedroom 2	1	2750	4601	SE	0	Yes
Bedroom 2	1	2750	3300	NE	0	Yes
Bedroom 3	4	2750	4003	SE	0	No
Bedroom 3	4	2750	542	SW	0	Yes
Bedroom 4	2	2750	4546	NW	0	No
Bedroom 4	4	2750	3849	SW	0	Yes
Bedroom 4	4	2750	3652	SE	0	Yes
Study	4	2750	1996	SE	0	No
Upper Foyer	2	2750	10505	NW	0	No
Upper Foyer	2	2750	997	NE	0	No
Bath	4	2750	3779	SE	0	No
Bath	4	2750	444	NE	0	Yes
Bath	4	2750	440	SW	0	Yes

Internal wall *type*

Wall ID	Wall type	Area (m²)	Bulk insulation
1	FR5 - Internal Plasterboard Stud Wall	75.2	
2	Int - Internal Stud Wall - R2.0	79.9	Glass fibre batt: R2.0 (R2.0)

Floor *type*

Location	Construction	Area (m²)	Sub-floor ventilation	Added insulation (R-value)	Covering
Bedroom 1	CSOG - Concrete Slab on Ground	10.1	Enclosed	R0.0	Timber
Bedroom 1	CSOG - Concrete Slab on Ground	5.2	Enclosed	R0.0	Timber
WIR 1	CSOG - Concrete Slab on Ground	3.1	Enclosed	R0.0	Timber
Entry	CSOG - Concrete Slab on Ground	9.2	Enclosed	R0.0	Timber
Entry	CSOG - Concrete Slab on Ground	1.9	Enclosed	R0.0	Timber
Hallway	CSOG - Concrete Slab on Ground	14.2	Enclosed	R0.0	Timber
Linen	CSOG - Concrete Slab on Ground	1.8	Enclosed	R0.0	Timber
Laundry	CSOG - Concrete Slab on Ground	3.8	Enclosed	R0.0	Tiles
Laundry	CSOG - Concrete Slab on Ground	2.6	Enclosed	R0.0	Tiles
Powder	CSOG - Concrete Slab on Ground	2.5	Enclosed	R0.0	Tiles
Ensuite	CSOG - Concrete Slab on Ground	2	Enclosed	R0.0	Tiles
Ensuite	CSOG - Concrete Slab on Ground	3	Enclosed	R0.0	Tiles
Kitchen/Living/D-ining	CSOG - Concrete Slab on Ground	29.3	Enclosed	R0.0	Timber
Kitchen/Living/D-ining	CSOG - Concrete Slab on Ground	25.2	Enclosed	R0.0	Timber
Bedroom 2	INTFLR - Intermediate Floor R0.0	1.5	Elevated	R0.0	Timber
Bedroom 2	INTFLR - Intermediate Floor R0.0	13.7	Enclosed	R0.0	Timber
Bedroom 3	INTFLR - Intermediate Floor R0.0	13.2	Enclosed	R0.0	Timber
Bedroom 4	INTFLR - Intermediate Floor R0.0	15	Enclosed	R0.0	Timber

Study	INTFLR - Intermediate Floor R0.0	4.1	Enclosed	R0.0	Timber
Upper Foyer	INTFLR - Intermediate Floor R0.0	19.3	Enclosed	R0.0	Timber
Bath	INTFLR - Intermediate Floor R0.0	8.1	Enclosed	R0.0	Tiles

Ceiling *type*

Location	Construction material/type	Bulk insulation R-value (may include edge batt values)	Reflective wrap*
Bedroom 1	INTFLR - Intermediate Floor R0.0	R0.0	No
Bedroom 1	Plasterboard	R4.8	Yes
WIR 1	INTFLR - Intermediate Floor R0.0	R0.0	No
Entry	INTFLR - Intermediate Floor R0.0	R0.0	No
Entry	Plasterboard	R4.8	Yes
Hallway	INTFLR - Intermediate Floor R0.0	R0.0	No
Linen	INTFLR - Intermediate Floor R0.0	R0.0	No
Laundry	INTFLR - Intermediate Floor R0.0	R0.0	No
Laundry	Plasterboard	R4.8	Yes
Powder	INTFLR - Intermediate Floor R0.0	R0.0	No
Ensuite	INTFLR - Intermediate Floor R0.0	R0.0	No
Ensuite	Plasterboard	R4.8	Yes
Kitchen/Living/D-ining	INTFLR - Intermediate Floor R0.0	R0.0	No
Kitchen/Living/D-ining	Plasterboard	R4.8	Yes
Bedroom 2	Plasterboard	R4.8	Yes
Bedroom 2	Plasterboard	R4.8	Yes
Bedroom 3	Plasterboard	R4.8	Yes
Bedroom 4	Plasterboard	R4.8	Yes
Study	Plasterboard	R4.8	Yes
Upper Foyer	Plasterboard	R4.8	Yes
Bath	Plasterboard	R4.8	Yes

Ceiling *penetrations**

Location	Quantity	Type	Diameter (mm)	Sealed/unsealed
Laundry	1	Exhaust Fans	280	Sealed
Powder	1	Exhaust Fans	280	Sealed
Ensuite	1	Exhaust Fans	280	Sealed
Kitchen/Living/Dining	1	Exhaust Fans	150	Sealed
Kitchen/Living/Dining	1	Heater Flues	200	Unsealed
Bath	1	Exhaust Fans	280	Sealed

Ceiling *fans*

Location	Quantity	Diameter (mm)
No Data Available		

* Refer to glossary.

Roof *type*

Construction	Added insulation (R-value)	Solar absorptance	Roof shade
Framed:Flat - Flat Framed (Metal Deck)	0.0	0.5	Medium

Explanatory Notes

About this report

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

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

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

Accredited assessors

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

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

AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any ongoing training requirements.

Any questions or concerns about this report should be directed to the assessor in the first instance. If the assessor is unable to address these questions or concerns, the AAO specified on the front of this certificate should be contacted.

Disclaimer

The format of the NatHERS Certificate was developed by the NatHERSAdministrator. However the content of each individual certificate is entered and created by the assessor to create a NatHERS Certificate. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

The predicted annual energy load in this NatHERS Certificate is an estimate based on an assessment of the building by the assessor. It is not a prediction of actual energy use, but may be used to compare how other buildings are likely to perform when used in a similar way.

Information presented in this report relies on a range of standard assumptions (both embedded in NatHERS accredited software and made by the assessor who prepared this report), including assumptions about occupancy, indoor air temperature and local climate.

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

Glossary

Annual energy load	the predicted amount of energy required for heating and cooling, based on standard occupancy assumptions.
Assessed floor area	the floor area modelled in the software for the purpose of the NatHERS assessment. Note, this may not be consistent with the floor area in the design documents.
Ceiling penetrations	features that require a penetration to the ceiling, including downlights, vents, exhaust fans, rangehoods, chimneys and flues. Excludes fixtures attached to the ceiling with small holes through the ceiling for wiring, e.g. ceiling fans; pendant lights, and heating and cooling ducts.
Conditioned	a zone within a dwelling that is expected to require heating and cooling based on standard occupancy assumptions. In some circumstances it will include garages.
Custom windows	windows listed in NatHERS software that are available on the market in Australia and have a WERS (Window Energy Rating Scheme) rating.
Default windows	windows that are representative of a specific type of window product and whose properties have been derived by statistical methods.
Entrance door	these signify ventilation benefits in the modelling software and must not be modelled as a door when opening to a minimally ventilated corridor in a Class 2 building.
Exposure category - exposed	terrain with no obstructions e.g. flat grazing land, ocean-frontage, desert, exposed high-rise unit (usually above 10 floors).
Exposure category - open	terrain with few obstructions at a similar height e.g. grasslands with few well scattered obstructions below 10m, farmland with scattered sheds, lightly vegetated bush blocks, elevated units (e.g. above 3 floors).
Exposure category - suburban	terrain with numerous, closely spaced obstructions below 10m e.g. suburban housing, heavily vegetated bushland areas.
Exposure category - protected	terrain with numerous, closely spaced obstructions over 10 m e.g. city and industrial areas.
Horizontal shading feature	provides shading to the building in the horizontal plane, e.g. eaves, verandahs, pergolas, carports, or overhangs or balconies from upper levels.

National Construction Code (NCC) Class	the NCC groups buildings by their function and use, and assigns a classification code. NatHERS software models NCC Class 1, 2 or 4 buildings and attached Class 10a buildings. Definitions can be found at www.abcb.gov.au.
Opening Percentage	the openability percentage or operable (moveable) area of doors or windows that is used in ventilation calculations.
Provisional value	an assumed value that does not represent an actual value. For example, if the wall colour is unspecified in the documentation, a provisional value of 'medium' must be modelled. Acceptable provisional values are outlined in the NatHERS Technical Note and can be found at www.nathers.gov.au
Reflective wrap (also known as foil)	can be applied to walls, roofs and ceilings. When combined with an appropriate airgap and emissivity value, it provides insulative properties.
Roof window	for NatHERS this is typically an operable window (i.e. can be opened), will have a plaster or similar light well if there is an attic space, and generally does not have a diffuser.
Shading device	a device fixed to windows that provides shading e.g. window awnings or screens but excludes eaves.
Shading features	includes neighbouring buildings, fences, and wing walls, but excludes eaves.
Solar heat gain coefficient (SHGC)	the fraction of incident solar radiation admitted through a window, both directly transmitted as well as absorbed and subsequently released inward. SHGC is expressed as a number between 0 and 1. The lower a window's SHGC, the less solar heat it transmits.
Skylight (also known as roof lights)	for NatHERS this is typically a moulded unit with flexible reflective tubing (light well) and a diffuser at ceiling level.
U-value	the rate of heat transfer through a window. The lower the U-value, the better the insulating ability.
Unconditioned	a zone within a dwelling that is assumed to not require heating and cooling based on standard occupancy assumptions.
Vertical shading features	provides shading to the building in the vertical plane and can be parallel or perpendicular to the subject wall/window. Includes privacy screens, other walls in the building (wing walls), fences, other buildings, vegetation (protected or listed heritage trees).

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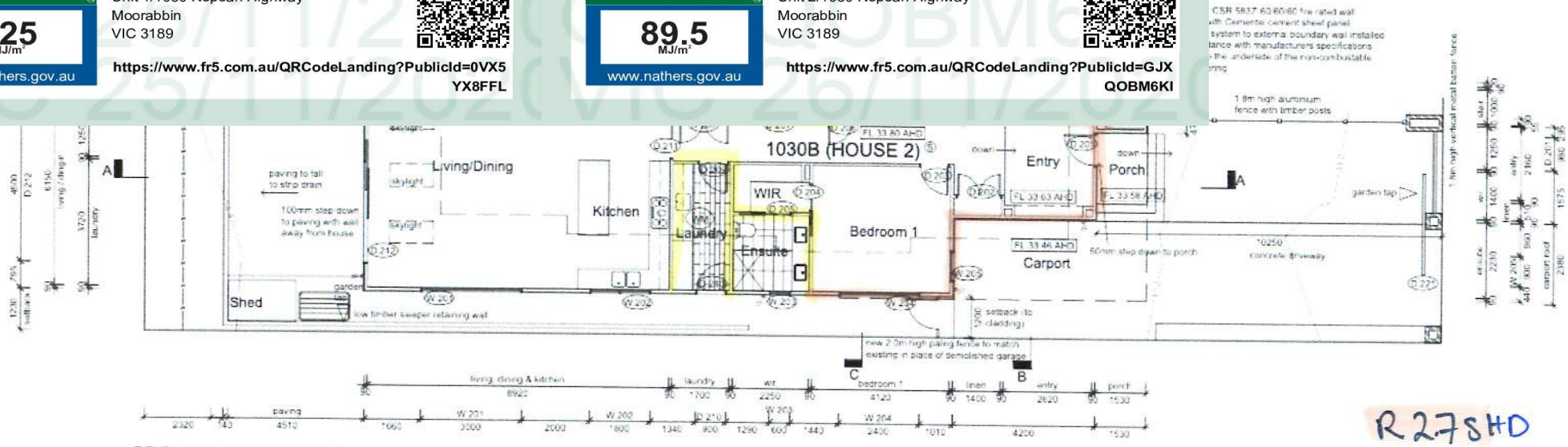
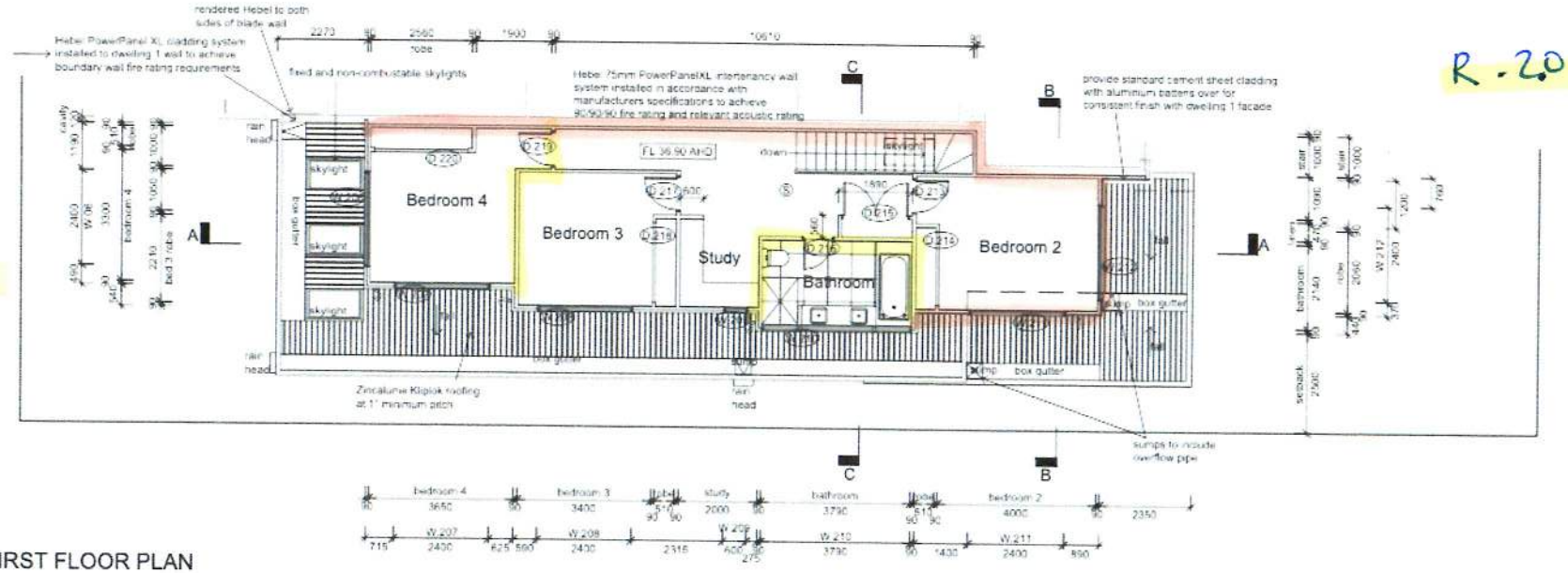


GROUND FLOOR PLAN

R2.7 HD



FIRST FLOOR PLAN

R.2.0 HD

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NATIONWIDE HOUSE ENERGY RATING SCHEME 6 — 125 MJ/m² — www.nathers.gov.au

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NATIONWIDE HOUSE ENERGY RATING SCHEME 7 — 89.5 MJ/m² — www.nathers.gov.au

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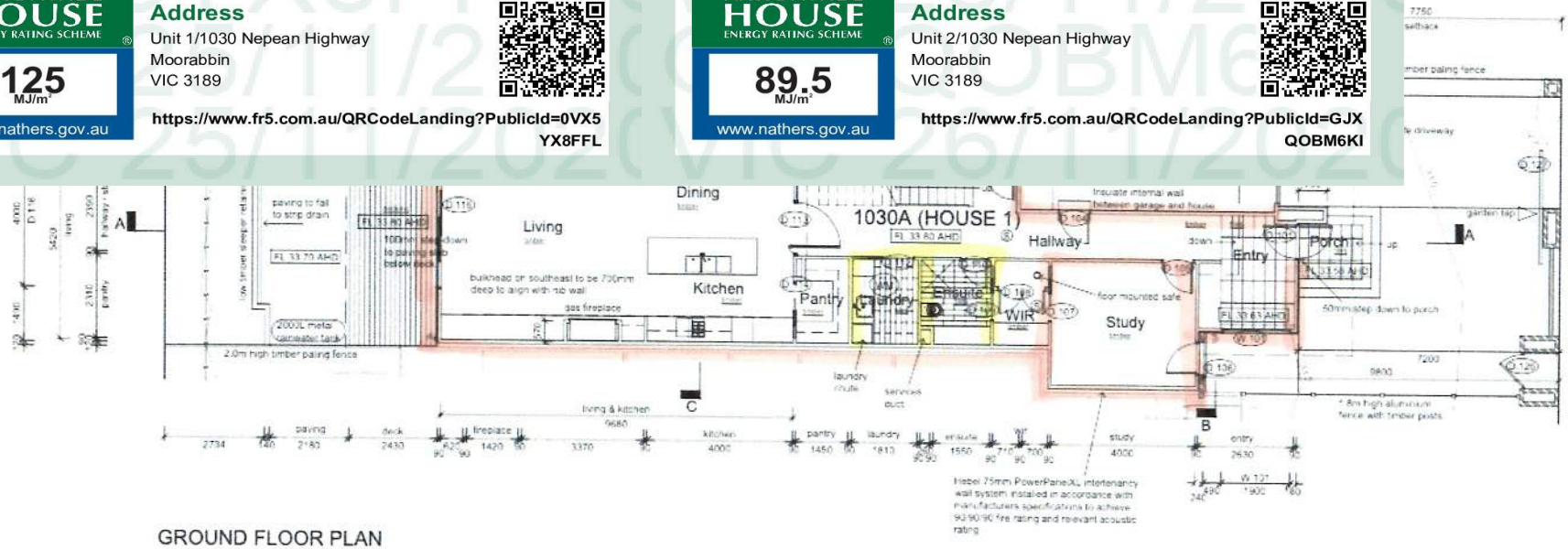
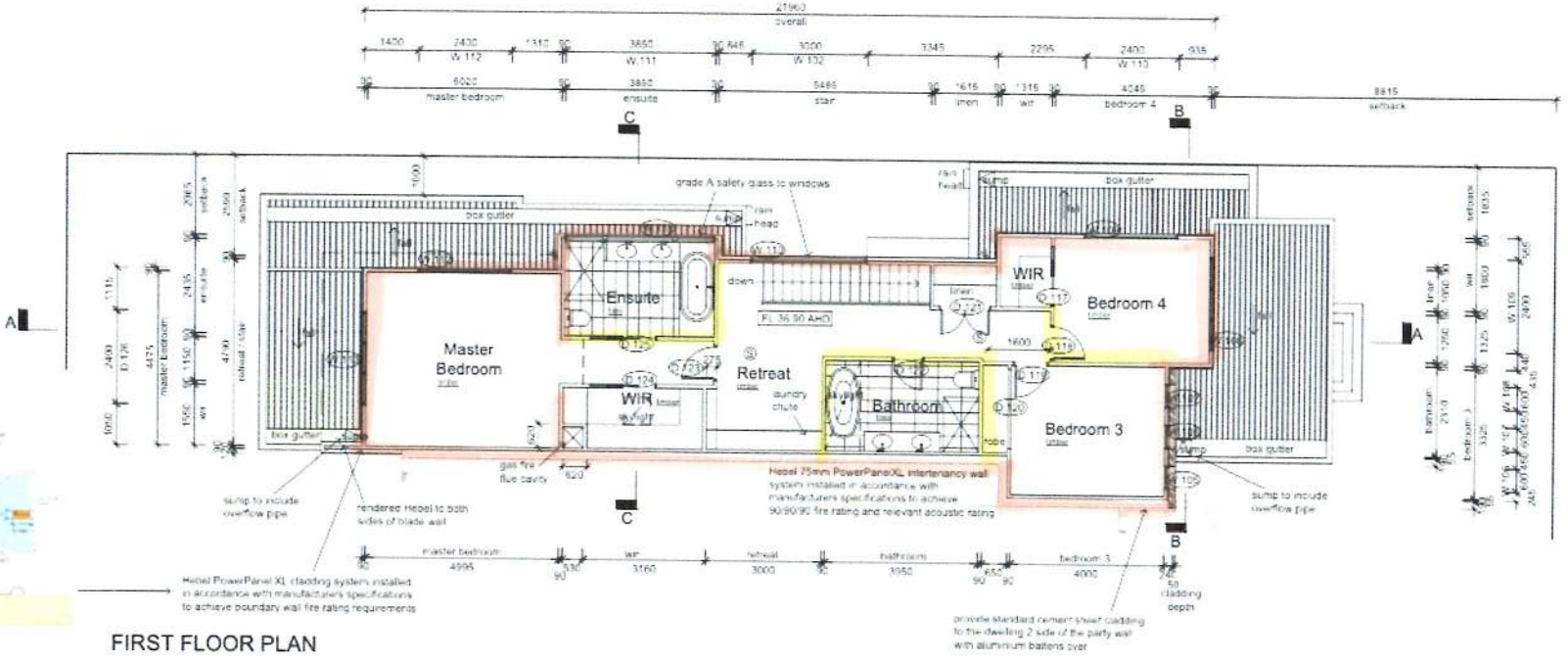


GROUND FLOOR PLAN



FIRST FLOOR PLAN

R2.7 SHD

R2.0 HD

iCheck Building Surveyors & Consultants
APPROVED PLANS AND DOCUMENTATION
Date 23 Jul 2020
Permit No 7677200805797 / 0
Relevant Building Surveyor
Mitroklis Jim Menelaou - BSU38261