

Thermal Comfort & BASIX Assessment

BUILDING
SUSTAINABILITY
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Design Vines
Proposed Residential Development
To be built at:
2 – 8 Rickard Road,
Narrabeen NSW 2101

Issue	File Ref	Description	Author	Date
A	-	Original Thermal Comfort and BASIX Assessment	-	12/07/11
B	16-0003	NEW DA – updated thermal and BASIX assessment	TMC	12/05/16
C	16-0003	NatHERS certification & BASIX certification	TMC	23/05/16
D	17-0230	Update - BASIX & thermal comfort assessment	DO	3/04/17
E	23-4455R	Update – NatHERS & Basix Assessment	MF	27/06/23

This report has been prepared by Efficient Living Pty Ltd on behalf of our client Haviland Architects. 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.



Prepared for Design Vines

Contact Mitchell Bye

Phone: 0431 858 117 Email: mitchbye@designvines.com

Introduction Efficient Living has investigated the estimated thermal comfort, water and energy usage of the proposed development to be built at 2 – 8 Rickard Road, Narrabeen, NSW 2101.

Heating and cooling loads for the development have been determined using BERS thermal simulation software. The report is based on the architectural drawings provided by Haviland Architects. For further details, refer to the individual BASIX certificates and Efficient Living inclusions summary respectively.

Analysis The BASIX assessment is divided into three sections, each independently measuring the efficiency of the development. These are Water, Thermal Comfort and Energy.

BASIX requires a minimum target of 40% for the Water section. A BERS pass or fail is required for the thermal comfort section and a minimum required target of 30% for the energy section.

Water The proposed development has achieved the BASIX Water target of 40%.

The water usage of the development is calculated based on the number and efficiency of permanent fixtures and appliances such as taps, showerheads and toilets, the dish washer and clothes washing machine.

The size of the rain tank and number of connections has a huge impact on your water score as does the area of gardens and lawns and whether or not low water plant species are incorporated.

Thermal comfort Thermal Comfort targets are set by the Department of Planning in the form of heating and cooling caps. The buildings thermal physics is measured using BERS thermal performance assessment tools. This equates an expected level of energy consumption to heat and cool each dwelling per annum expressed in MJ (megajoules) per square meter of floor area.

Each unit has individual heating and cooling caps and a weighted average heating and cooling load for the whole development. The weighted average caps are a lot harder to achieve than the individual unit caps.

Energy The proposed development has achieved the energy target of 30% to pass this section.

The energy usage of the development is calculated based on the efficiency of fixed appliances that will be used. This includes the air conditioning system, hot water system, lighting, exhaust fans, cook top, oven, and clothes drying facilities.

Inclusions summary The inclusions as outlined in the table below have been incorporated in each unit to allow them to reach their environmental sustainability targets.

Thermal comfort Average heating loads are 30% below allowable BASIX targets
Average cooling loads are 39% below allowable BASIX targets

Glazing Doors/windows Aluminium framed single clear glazing to all units:
U-Value: 6.70 (equal to or lower than) SHGC: 0.57 ($\pm 10\%$)
A – awning windows, casement windows & hinged glazed doors
U-Value: 6.70 (equal to or lower than) SHGC: 0.70 ($\pm 10\%$)
B – Fixed glazing, glazed sliding doors & louvres windows.

Aluminium framed performance glazing as per assessor certificate:
U-Value: 4.8 (equal to or lower than) SHGC: 0.51 ($\pm 10\%$)
A – awning windows, casement windows & hinged glazed doors
U-Value: 4.8 (equal to or lower than) SHGC: 0.59 ($\pm 10\%$)
B – Fixed glazing, glazed sliding doors & louvres windows.
Given values are NFRC, total window values

Roof Concrete roof no insulation
Default light colour

Ceiling Plasterboard ceiling, an R1.2 insulation where exposed roof above
Plasterboard ceiling, no insulation where neighbouring units are directly above
Note: Loss of ceiling insulation due to penetrations from down lights have been accounted for in accordance with BCA Technical Notes, assume non-ventilated LED down lights IC abutted and covered.

External wall Cavity brick with polystyrene insulation – total wall system R-value R1.49 first floor units
Reverse brick veneer with cladding, R1.5 insulation to second floor units
200mm Concrete wall with plasterboard internally, R1.0 insulation (insulation only value) **as per assessor certificate**
Default medium colour



Inter tenancy walls	200mm dincell concrete, plasterboard lined direct stick both sides with R1.0 insulation to walls shared to corridor, lift shaft and stair well
Walls with-in dwellings	Plasterboard on studs – no insulation
Floors	Concrete – R1.2 subfloor insulation required to units with floor exposed to outside & garage soffit as per assessor certificate Concrete between levels no insulation
Floor coverings	Carpet to bedrooms, and tiles elsewhere
BASIX water inclusions	Score 40/40
Fixtures within units	Showerheads: Mid flow (>6.0L but <=7.5 L/min) Toilets: 4.0 star Kitchen taps: 5.0 star Bathroom vanity taps: 5.0 star
Appliances within units	Dishwashers: 4.0 star
Central rainwater storage	Tank size 5,000L Collecting from 200m ² roof area Connected to outdoor tap for irrigation of common landscaping
BASIX energy inclusions	Score 31/30
Hot water system	Individual gas instantaneous hot water systems – 6 stars
Lift motors	All lifts to have gearless traction with VVVF motor
Appliances & other efficiency measures within units	Gas cooktop & electric oven Dishwashers: 3.0 star Clothes dryers: 2.0 star Well ventilated fridge space
Heating & cooling within units	All units to have individual, single phase, reverse cycle air conditioning to living areas and at least 1 bedroom. A minimum 2.5-3.0 EER is required in cooling mode.



	<p>A minimum 3.0-3.5 EER is required in heating mode.</p> <p>Day/night zoning nominated</p>
Artificial lighting within units	At least 80% of all light fittings with-in each room are to have fluorescent or LED globes.
Ventilation within units	<p>Bathroom – Individual fan, ducted to roof or façade – manual on / manual off switch</p> <p>Laundry – Individual fan, ducted to roof or façade – manual on / manual off switch</p> <p>Kitchen range hood – Individual fan, ducted to roof or façade – man on / man off switch</p>
Artificial lighting to common areas	<p>Car park Residential: fluorescent light – zoned switching and motion sensors</p> <p>Lift cars: LED lighting – connected to call switch button</p> <p>Garbage room Residential: fluorescent lighting – manual on / manual off</p> <p>Hallways: compact fluorescent lighting – zoned switching and motion sensors</p>
Ventilation to common areas	<p>Car park Residential: ventilation supply only – carbon monoxide monitor + VSD fan</p> <p>Garbage room Residential: ventilation exhaust – no efficiency measure</p> <p>Hallways: no mechanical ventilation</p>
Alternative energy	3.0 kW of photovoltaic system is required for this development
Documentation	This report is based upon the following plans prepared by Haviland Architects
Report Contact	<p>Mariana Foganhole</p> <p>Phone: (02) 9970 6181 Email: mariana@efficientliving.com.au</p>





Thermal Comfort Results

Proposed Residential Development

2 – 8 Rickard Road, Narrabeen



Issued in accordance with **BASIX** Thermal Comfort Simulation Method

Certificate # 0001365610				Issued: 27/06/2023		Accreditation #		HERA10033	
Thermal performance specifications									Page 1 of 1
Unit number	Number of Bedrooms	Floor area (M²)		Predict. loads (MJ/M²/y)		Star Rating	Window in Bathroom	Window in Kitchen	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)				
Apt1	1	51	0	63.8	20.3	4.0	0	Yes	R1.0 to external concrete walls Performance glazing to dining/living sliding doors
Apt 2	1	65	0	64.5	15.3	4.3	0	No	R1.2 floor insulation – floor open to air R1.0 to external concrete walls Performance glazing throughout
Apt 3	3	128	0	38.5	25	5.2	0	No	None
Apt 4	2	77	7	39.7	20	5.4	1	No	None
Apt 5	2	85.3	0	64.3	14.2	4.4	0	No	R1.2 floor insulation – floor open to air R1.0 to external concrete walls
Apt 6	2	79.8	0	39.6	17.1	5.6	0	No	R1.0 to external concrete walls
Apt 7	1	59.0	0	52.1	26.2	4.4	0	No	None
Apt 8	2	100.3	0	63.4	9.6	4.6	1	Yes	R1.2 floor insulation – floor open to air R1.0 to external concrete walls R1.0 insulation to walls to corridor Performance glazing to dining/living sliding doors
Apt 9	2	79.6	0	45.2	14.5	5.4	0	No	R1.2 floor insulation – floor open to air
Apt 10	2	73	0	55.1	14.8	4.8	0	No	R1.2 floor insulation – floor open to air
Apt 11	1	51	0	63.5	28.2	3.9	0	Yes	R1.0 to external concrete walls Performance glazing to dining/living sliding doors
Apt 12	1	65	0	60.6	32.7	3.8	0	No	R1.0 to external concrete walls
Apt 13	3	128	0	35.7	41.3	4.4	0	No	None
Apt 14	2	77	7	34.6	32.7	4.9	1	No	None
Apt 15	2	85.3	0	40.8	19.4	5.4	0	No	R1.0 insulation to walls to corridor



Thermal Comfort Results

Proposed Residential Development

2 – 8 Rickard Road, Narrabeen



Issued in accordance with **BASIX** Thermal Comfort Simulation Method

Apt 16	2	79.8	0	30.7	23.1	5.8	0	No	None
Apt 17	1	59.0	0	45.9	39.3	4.1	0	No	R1.0 insulation to walls to corridor
Apt 18	2	100.3	0	53.4	15.2	4.9	0	Yes	R1.2 floor insulation – floor open to air R1.0 to external concrete walls Performance glazing to dining/living sliding doors
Apt 19	2	79.6	0	45.4	18.5	5.1	0	No	None
Apt 20	2	73	0	39.5	27.9	4.9	0	No	None

Nationwide House Energy Rating Scheme — Class 2 summary

NatHERS Certificate No. 0001365610

Generated on 27 Jun 2023 using BERS Pro v4.4.1.5 (3.21)

Property

Address 2-8 Rickard Road , Narrabeen , NSW , 2101

Lot/DP 171/16212

NatHERS climate zone 56

Accredited assessor



Tracey Cools

Efficient Living Pty Ltd

admin@efficientliving.com.au

02 9970 6181

Accreditation No. HERA10033

Assessor Accrediting Organisation HERA



Verification

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

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m ² /p.a.)	Cooling load (MJ/m ² /p.a.)	Total load (MJ/m ² /p.a.)	Star rating
0008730806	1	63.8	20.3	84.1	4.1
0008730855	2	64.5	15.3	79.8	4.3
0008730889	3	38.9	25.1	64	5.1
0008730822	4	39.7	20	59.7	5.4
0008730848	5	64.3	14.2	78.4	4.4

National Construction Code (NCC) requirements

Continued Over

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.

Summary of all dwellings (continued)

Certificate number and link	Unit Number	Heating load (MJ/m ² /p.a.)	Cooling load (MJ/m ² /p.a.)	Total load (MJ/m ² /p.a.)	Star rating
<u>0008730871</u>	6	39.6	17.1	56.6	5.6
<u>0008730814</u>	7	52.1	26.2	78.3	4.4
<u>0008730830</u>	8	63.4	9.6	73	4.6
<u>0008730863</u>	9	45.2	14.5	59.7	5.4
<u>0008730913</u>	10	55.1	14.8	69.9	4.8
<u>0008730947</u>	11	63.5	28.2	91.7	3.9
<u>0008730962</u>	12	60.6	32.7	93.3	3.8
<u>0008730988</u>	13	35.7	41.3	76.9	4.4
<u>0008730897</u>	14	34.6	32.7	67.3	4.9
<u>0008730939</u>	15	40.8	19.4	60.2	5.4
<u>0008730954</u>	16	30.7	23.1	53.8	5.8
<u>0008730970</u>	17	45.9	39.3	85.2	4.1
<u>0008730905</u>	18	53.4	15.2	68.6	4.9
<u>0008730921</u>	19	45.4	18.5	63.9	5.1
<u>0008730996</u>	20	39.5	27.9	67.4	4.9
Average		48.84	22.77	71.59	4.76

Explanatory notes

About this report

This summary rating is the average rating of all NCC Class 2 dwellings in a development. The individual dwellings' ratings are a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate the 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. For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

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). 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.

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, input and creation of the NatHERS Certificate is by the assessor. 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.

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 382273M_05

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

This certificate is a revision of certificate number 382273M_02 lodged with the consent authority or certifier on 28 June 2016 with application DA N0267/16.




It is the responsibility of the applicant to verify with the consent authority that the original, or any revised certificate, complies with the requirements of Schedule 1 Clause 2A, 4A or 6A of the Environmental Planning and Assessment Regulation 2000

Secretary

Date of issue: Monday, 07 August 2023

To be valid, this certificate must be lodged within 3 months of the date of issue.



Project summary		
Project name	AJ and AM Gleeson_05	
Street address	2-8 Rickard Road Narrabeen 2101	
Local Government Area	Warringah Council	
Plan type and plan number	deposited 16212	
Lot no.	171	
Section no.	-	
No. of residential flat buildings	1	
No. of units in residential flat buildings	20	
No. of multi-dwelling houses	0	
No. of single dwelling houses	0	
Project score		
Water	 40	Target 40
Thermal Comfort	 Pass	Target Pass
Energy	 31	Target 30

Certificate Prepared by

Name / Company Name: Efficient Living Pty Ltd

ABN (if applicable): 82116346082

Description of project

Project address

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Project type

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No. of single dwelling houses	0

Site details

Site area (m ²)	1954.55
Roof area (m ²)	914.2
Non-residential floor area (m ²)	416.0
Residential car spaces	40
Non-residential car spaces	15

Common area landscape

Common area lawn (m ²)	52.2
Common area garden (m ²)	446.4
Area of indigenous or low water use species (m ²)	0.0

Assessor details

Assessor number	HERA10033
Certificate number	0001365610
Climate zone	56

Project score

Water	✓ 40	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 31	Target 30

Description of project

The tables below describe the dwellings and common areas within the project

Residential flat buildings - 2-8 Rickard Road, Narrabeen, 20 dwellings, 4 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1	1	51.0	0.0	0.0	0.0
6	2	79.8	0.0	0.0	0.0
11	1	51.0	0.0	0.0	0.0
16	2	79.8	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
2	1	65.0	0.0	0.0	0.0
7	1	59.0	0.0	0.0	0.0
12	1	65.0	0.0	0.0	0.0
17	1	59.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
3	3	128.0	0.0	0.0	0.0
8	2	100.3	0.0	0.0	0.0
13	3	128.0	0.0	0.0	0.0
18	2	100.3	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
4	2	77.0	7.0	0.0	0.0
9	2	79.6	0.0	0.0	0.0
14	2	77.0	7.0	0.0	0.0
19	2	79.6	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
5	2	85.3	0.0	0.0	0.0
10	2	73.0	0.0	0.0	0.0
15	2	85.3	0.0	0.0	0.0
20	2	73.0	0.0	0.0	0.0

Description of project

The tables below describe the dwellings and common areas within the project

Common areas of unit building - 2-8 Rickard Road, Narrabeen

Common area	Floor area (m ²)
Car park Residential	1152.0
Garbage room Residential	41.1
Ground floor lobby type (No. 2)	38.7

Common area	Floor area (m ²)
Lift car (No. 1)	-
Residential Store Rooms	27.4
Hallways	138.6

Common area	Floor area (m ²)
Lift car (No.2)	-
Ground floor lobby type	66.0

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - 2-8 Rickard Road, Narrabeen

(a) Dwellings

- (i) Water
- (ii) Energy
- (iii) Thermal Comfort

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for multi-dwelling houses

3. Commitments for single dwelling houses

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

- (i) Water
- (ii) Energy

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.

1. Commitments for Residential flat buildings - 2-8 Rickard Road, Narrabeen

(a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✓	✓	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✓	✓
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✓	✓
(e) The applicant must install:			
(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and		✓	✓
(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling.		✓	✓
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✓	✓	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✓	
(g) The pool or spa must be located as specified in the table.	✓	✓	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✓	✓	✓

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	4 star	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
None	-	-	-	-	-	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.	✓	✓	✓
(c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.		✓	✓
(d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.		✓	✓
(e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✓	✓	✓
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✓ ✓	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓ ✓ ✓	✓
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	gas instantaneous 6 star	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
1, 11	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1	1	yes	yes	yes	yes	0	yes
3, 13	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	3	1	yes	yes	yes	yes	0	no
4, 14	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1	1	yes	yes	yes	yes	1	no
5, 15	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	2	1	yes	yes	yes	yes	0	yes
8, 18	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	2	1	yes	yes	yes	yes	1	yes
2, 7, 12, 17	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1	1	yes	yes	yes	yes	0	no
All other dwellings	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 2.5 - 3.0 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	2	1	yes	yes	yes	yes	0	no

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	gas cooktop & electric oven	-	yes	3 star	-	2 star	no	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) 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 a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol 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.	✓		
(e) 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.		✓	
(f) 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.		✓	✓
(g) Where there is an in-slab heating or cooling system, the applicant must: (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✓	✓	✓
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✓	✓	✓

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
1	63.8	20.3
2	64.5	15.3
3	38.5	25.0
4	39.7	20.0
5	64.3	14.2
6	39.6	17.1
7	52.1	26.2
8	63.4	9.6
9	45.2	14.5
10	55.1	14.8
11	63.5	28.2
12	60.6	32.7
13	35.7	41.3
14	34.6	32.7
15	40.8	19.4
16	30.7	23.1
17	45.9	39.3
18	53.4	15.2
19	45.4	18.5
All other dwellings	39.5	27.9

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	no common facility	no common facility	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central water tank - rainwater or stormwater (No. 1)	5000.0	To collect run-off from at least: - 200.0 square metres of roof area of buildings in the development - 0.0 square metres of impervious area in the development - 0.0 square metres of garden/lawn area in the development - 0.0 square metres of planter box area in the development (excluding, in each case, any area which drains to, or supplies, any other alternative water supply system).	- irrigation of 498.56 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Common area	Common area ventilation system		Common area lighting		
	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Car park Residential	ventilation supply only	carbon monoxide monitor + VSD fan	fluorescent	zoned switching with motion sensor	No
Lift car (No. 1)	-	-	light-emitting diode	connected to lift call button	No
Lift car (No.2)	-	-	light-emitting diode	connected to lift call button	No
Garbage room Residential	ventilation exhaust only	-	fluorescent	manual on / manual off	No
Residential Store Rooms	no mechanical ventilation	-	fluorescent	manual on / manual off	No
Ground floor lobby type	ventilation supply only	none ie. continuous	compact fluorescent	motion sensors	No
Ground floor lobby type (No. 2)	no mechanical ventilation	-	compact fluorescent	motion sensors	No
Hallways	no mechanical ventilation	-	compact fluorescent	zoned switching with motion sensor	No

Central energy systems	Type	Specification
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 4
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 4

4. Commitments for common areas and central systems/facilities for the development (non-building specific)

(b) Common areas and central systems/facilities

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.		✓	✓
(b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table.	✓	✓	✓
(c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.	✓	✓	
(d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.		✓	
(e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.		✓	✓
(f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.		✓	✓

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	no common facility	no common facility	no common laundry facility

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Central energy systems	Type	Specification
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 3.0 peak kW

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. 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).
2. 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.
3. Commitments identified with a "✓" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).