

Thermal Comfort & BASIX Assessment

BUILDING
SUSTAINABILITY
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Cbus Property
Proposed Residential Development – Terraces & Units
To be built at:
Lot S1, Newmarket Green
1 Young Street, Randwick NSW 2031

Issue	File Ref	Description	Author	Date
A	16-0730	Thermal comfort and BASIX Assessment	HE/DG/TMC	06/10/16
B	-	BASIX update – day/night zoning removed	PV	18/11/16
C	17-1073	Update BASIX and thermal comfort assessment	DO	08/09/17
D	18-0064	Update BASIX and thermal comfort assessment due to small layout amendments	PV	17/01/18

This report has been prepared by Efficient Living Pty Ltd on behalf of our client Cbus Property. 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 Cbus Property - Suite 5, Level 5, 5 Martin Place, Sydney NSW 2000

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Care of Bates Smart - Alex Dircks - Phone: (02) 8354 5194

Introduction Efficient Living has investigated the estimated thermal comfort, water and energy usage of the proposed development to be built at Lot S1 Newmarket Green, Young St, Randwick NSW 2031.

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 Bates Smart. 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% to the units and 40% to the terraces 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 the units and 40% to the terraces 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 14% below allowable BASIX targets
Average cooling loads are 44% below allowable BASIX targets

Glazing
Doors/windows/clerestory 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 + hinged glazed doors
U-Value: 6.70 (equal to or lower than) SHGC: 0.70 ($\pm 10\%$)
B – sliding doors/windows + fixed glazing + louvres windows

Aluminium frame performance clear glazing – **As per assessor certificate**
U-Value: 4.80 (equal to or lower than) SHGC: 0.51 ($\pm 10\%$)
A – awning windows + hinged glazed doors
U-Value: 4.80 (equal to or lower than) SHGC: 0.59 ($\pm 10\%$)
B – sliding doors/windows + fixed glazing + louvres windows

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

Roof & Ceiling Units - Concrete roof - Default light colour
Terraces - Metal roof with builders blanket R1.0 - medium colour
Plasterboard ceiling – terraces & units
R1.2 insulation where exposed balcony or terrace above
R2.5 insulation where exposed roof above (top floor units)
R2.5 insulation to terrace garage ceiling where studios above
Plasterboard ceiling, where neighbouring units are above (no insulation)
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 Brick veneer with an R1.5 insulation
Light weight walls with an R1.5 insulation
Default medium colour to all external walls

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Fire sprinkler systems No BASIX restrictions

BASIX energy inclusions Score Units: 30/30 Townhouses: 40/40

Hot water system Central gas-fired boiler with R1.0 (~38mm) insulation to ring main and supply risers

Lift motors All lifts to have gearless traction with VVVF motor

Appliances & other efficiency measures

Units

Townhouses

Cooking:

Gas cooktop & electric oven

Gas cooktop & electric oven

Dishwashers:

3.0 star

N/A

Clothes dryers:

2.0 star

N/A

Well vented fridge space

Yes

Yes

Heating & cooling within units and terraces

All units and terraces to have individual, single phase, reverse cycle air conditioning to living areas and at least 1 bedroom.

Units

Townhouses

Cooling:

3.0 star

3.0 star

Heating:

3.0 star

3.0 star

Artificial lighting within units

At least 80% of all light fittings within each room are to have compact fluorescent or LED globes.

Ventilation within units

Bathroom – Individual fan, ducted to roof or façade – manual on / manual off switch

Laundry – Individual fan, ducted to roof or façade – manual on / manual off switch

Kitchen range hood – Individual fan, not ducted – manual on / manual off switch

Artificial lighting to common areas

Car park – Fluorescent lights with zoned switching and motion sensors

Lifts – LED lights connected to lift call button

Main Comms room – Fluorescent lights with manual on / manual off switch

Main switchroom - Fluorescent lights with manual on / manual off switch

Waste room - Fluorescent lights with motion sensor

Garbage rooms – Fluorescent lights with motion sensor



	<p>Mech room - Fluorescent lights with manual on / manual off switch</p> <p>RW Plant - Fluorescent lights with manual on / manual off switch</p> <p>Potable water Plant – Fluorescent lights with manual on / manual off switch</p> <p>Fire pump room - Fluorescent lights with manual on / manual off switch</p> <p>Energy storage - Fluorescent lights with manual on / manual off switch</p> <p>Ground floor lobbies – LEDs with zoned switching and motion sensors</p> <p>Hallways – LEDs with zoned switching and motion sensors</p>
Ventilation to common areas	<p>Car park – ventilation supply and exhaust – carbon monoxide monitor + VSD fan</p> <p>Main Comms room – Ventilation supply – thermostatically controlled</p> <p>Main switchroom - Ventilation supply – thermostatically controlled</p> <p>Waste room – Ventilation exhaust – no efficiency measure</p> <p>Garbage rooms – Ventilation exhaust – no efficiency measure</p> <p>Mech room – Ventilation supply – interlocked to light</p> <p>RW Plant - Ventilation supply – interlocked to light</p> <p>Potable water Plant – Ventilation supply – interlocked to light</p> <p>Fire pump room - Ventilation supply – interlocked to light</p> <p>Energy storage - Ventilation supply – interlocked to light</p> <p>Ground floor lobbies – Ventilation supply – natural ventilation</p> <p>Hallways – Ventilation supply – natural ventilation</p>
Alternative energy	3.5kWp photovoltaics required



Documentation This report is based upon the following plans prepared by SJB

Sheet Number	Sheet Name	Scale	Revision
S1.00.000	S1 Cover Sheet		5
S1.01.001	Lot S Building Arrangement		6
S1.02.001	Ground Floor & Basement Plan		13
S1.02.002	Level 1 & Level 2 Floor Plan		11
S1.02.003	Level 3 & Level 4 Floor Plan & Roof Plan		11
S1.06.001	Analysis - Area Plans GFA		6
S1.06.002	Analysis - Solar Access & Cross Ventilation		5
S1.07.001	Elevations		10
S1.08.001	Sections - Sheet 1		10
S1.08.002	Sections - Sheet 2		9
S1.08.200	Detailed Elevation & Section		2
S1.09.001	Shadow Diagrams - Sheet 1		6
S1.09.002	View From Sun - Winter Solstice		5
S1.10.001	Perspective 01		2
S1.10.002	Perspective 02		2

Report Contact Haylea Edwards & Tim Crowley - Phone: (02) 9970 6181
Email: haylea@efficientliving.com.au & tim@efficientliving.com.au



Issued in accordance with BASIX Thermal Comfort Simulation Method

Certificate # 0001893310							Accreditation # VIC/BDAV/12/1473
Thermal comfort Upgrades		As Per Assessor Certificate					
		Upgrade 1. - Performance glazing (A - U-value 4.80 & SHGC 0.58) OR (B - U-value 4.80 & SHGC 0.51)					
		Upgrade 2. - R1.2 insulation to firestairs and lift core					
Thermal performance specifications							
Unit number	Number of Bedrooms	Floor area (M ²)		Predict. loads (MJ/M ² /y)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
Units							
0.03	1	65	0	40	25	5.1	None - see base file inclusions in overview
0.02	2	79	0	52	28	4.4	None - see base file inclusions in overview
0.01	2	78	0	53	19	4.7	None - see base file inclusions in overview
1.03	1	65	0	65	22	4.1	None - see base file inclusions in overview
1.05	1	58	0	42	27	4.9	None - see base file inclusions in overview
1.01	2	78	0	16	22	7.1	None - see base file inclusions in overview
1.02	2	86	0	45	22	4.9	None - see base file inclusions in overview
2.03	1	65	0	48	25	4.6	None - see base file inclusions in overview
2.05	1	58	0	37	29	5.1	None - see base file inclusions in overview
2.01	2	78	0	19	16	7.4	None - see base file inclusions in overview
2.02	2	86	0	46	21	4.9	None - see base file inclusions in overview
3.03	1	65	0	53	25	4.4	None - see base file inclusions in overview
3.05	1	58	0	36	29	5.1	None - see base file inclusions in overview
3.01	2	78	0	20	16	7.3	None - see base file inclusions in overview
3.02	2	86	0	52	21	4.7	None - see base file inclusions in overview
4.01	3	104	5	66	39	3.4	Performance glazing tthroughout R1.2 insulation to fire stairs and lift core
4.02	3	127	0	66	38	3.5	Performance glazing to bedroom 1 and kitchen and living R1.2 insulation to fire stairs and lift core
Townhouses							
0.04	2	101	6	65	29	3.8	None - see base file inclusions in overview
0.05	2	101	6	58	31	3.9	None - see base file inclusions in overview
0.06	2	101	6	36	27	5.3	None - see base file inclusions in overview
0.07	2	101	6	39	25	5.2	None - see base file inclusions in overview
Terraces							
T.01	3	163	0	60	35	3.8	None - see base file inclusions in overview
T.02	3	163	0	43	33	4.4	None - see base file inclusions in overview
T.03	3	163	0	43	33	4.4	None - see base file inclusions in overview
T.05	3	163	0	43	33	4.4	None - see base file inclusions in overview
T.06	3	163	0	43	33	4.4	None - see base file inclusions in overview
T.07	3	163	0	43	33	4.4	None - see base file inclusions in overview
T.08	3	163	0	43	33	4.4	None - see base file inclusions in overview

Thermal Comfort Results
Proposed Residential Development

**S1 Newmarket Green,
 Young Street Randwick NSW 2031**



2 of 2

Issued in accordance with BASIX Thermal Comfort Simulation Method

Certificate # 0001893310						Accreditation # VIC/BDAV/12/1473	
Thermal comfort Upgrades		As Per Assessor Certificate					
		Upgrade 1. - Performance glazing (A - U-value 4.80 & SHGC 0.58) OR (B - U-value 4.80 & SHGC 0.51)					
		Upgrade 2. - R1.2 insulation to firestairs and lift core					
Thermal performance specifications							
Unit number	Number of Bedrooms	Floor area (M ²)		Predict. loads (MJ/M ² /y)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
T.09	3	163	0	43	33	4.4	None - see base file inclusions in overview
T.10	3	163	0	53	39	3.9	None - see base file inclusions in overview
Terrace Studios							
ST.01	1	39	7	50	56	3.4	None - see base file inclusions in overview
ST.02	1	39	7	45	57	3.6	None - see base file inclusions in overview
ST.03	1	39	7	45	57	3.6	None - see base file inclusions in overview
ST.05	1	39	7	45	57	3.6	None - see base file inclusions in overview
ST.06	1	39	7	45	57	3.6	None - see base file inclusions in overview
ST.07	1	39	7	45	57	3.6	None - see base file inclusions in overview
ST.08	1	39	7	45	57	3.6	None - see base file inclusions in overview
ST.09	1	39	7	45	56	3.6	None - see base file inclusions in overview
ST.10	1	39	7	46	47	3.9	None - see base file inclusions in overview

Nationwide House Energy Rating Scheme* — Class 2 summary



Certificate number: **0002380220**

Certificate Date: **17 Jan 2018**

★ Average Star rating: **5.0**

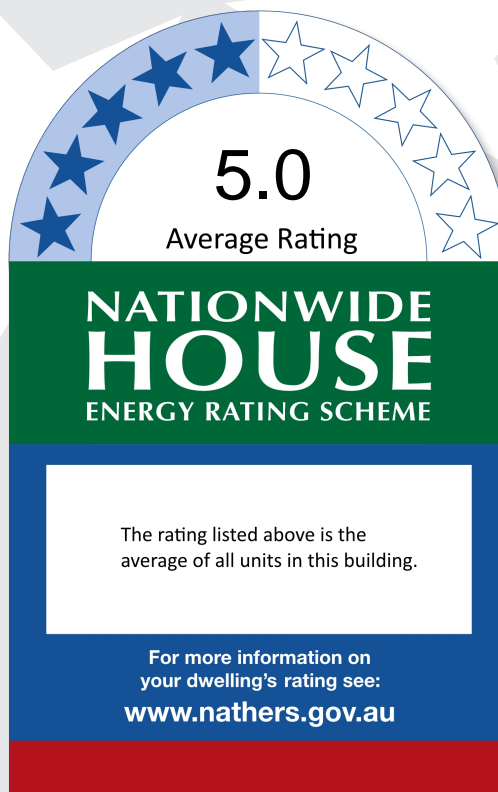
Assessor details

Accreditation number: **VIC/BDAV/12/1473**
Name: **Tracey Cools**
Organisation: **Efficient Living**
Email: **admin@efficientliving.com.au**
Phone: **(02) 9970 6181**
Declaration of interest: **None**
Software: **BERS Pro v4.3.0.2a (3.13)**
BERS Pro v4.3.0.1 (3.13)
AAO: **BDAV**

Dwelling details

Street: **Young Street**
Suburb: **Randwick**
State: **NSW**
Postcode: **2031**

Scan to access this certificate online and confirm this is valid.



Summary of all dwellings

Certificate Details

Certificate number	Unit number	Heating load	Cooling load	Total load	Star Rating
0000829002-01	G.02	40.0	25.0	64.0	5.1
0002380079	G.03	51.5	27.9	79.4	4.4
0000829036	G.0.4	53.0	20.0	73.0	4.7
0000828822-01	1.01	64.0	22.0	87.0	4.1
0000828830-01	1.02	42.0	27.0	69.0	4.9
0000828848-01	1.03	16.0	22.0	38.0	7.1
0000828871-01	1.04	45.0	21.0	66.0	4.9
0000828897-01	2.01	48.0	25.0	74.0	4.6
0000828905-01	2.02	37.0	29.0	65.0	5.1
0000828921	2.03	19.0	16.0	35.0	7.4
0000828939-01	2.04	46.0	21.0	67.0	4.9
0000828947-01	3.01	53.0	25.0	79.0	4.4
0000828954-01	3.02	36.0	29.0	65.0	5.1
0000828962	3.03	20.0	16.0	36.0	7.3
0000828970-01	3.04	52.0	21.0	73.0	4.7

Nationwide House Energy Rating Scheme* — Multiple-dwelling summary

Certificate number: **0001893280**

Certificate Date: **08 Sep 2017**

★ Average Star rating: **4.1**



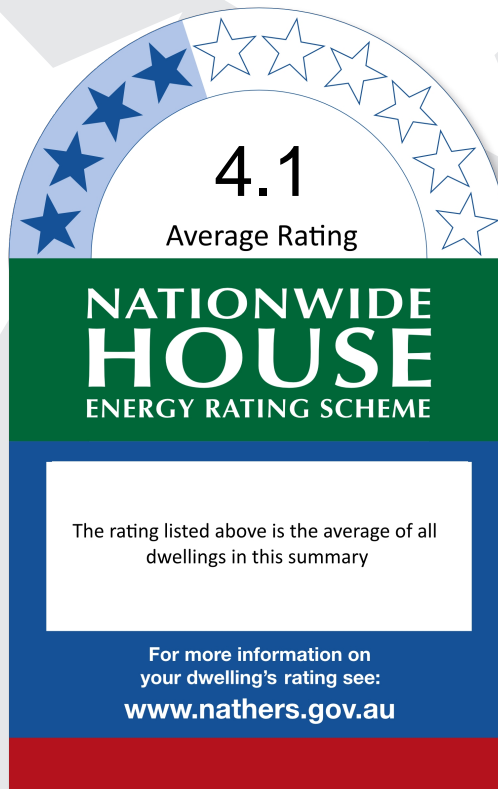
Assessor details

Accreditation number: **VIC/BDAV/12/1473**
Name: **Tracey Cools**
Organisation: **Efficient Living**
Email: **admin@efficientliving.com.au**
Phone: **(02) 9970 6181**
Declaration of interest: **None**
Software: **BERS Pro v4.3.0.1 (3.13)**
BERS Pro v4.3.0.2a (3.13)
AAO: **BDAV**

Dwelling details

Street: **Young Street**
Suburb: **Randwick**
State: **NSW**
Postcode: **2031**

Scan to access this certificate online and confirm this is valid.



Summary of all dwellings

Certificate Details

Certificate number	Dwelling/Unit number	Heating load	Cooling load	Total load	Star Rating
0000829358	0.04	65.0	29.0	95.0	3.8
0000829374	0.05	58.0	31.0	89.0	3.9
0000829366	0.06	36.0	27.0	62.0	5.3
0000829382	0.07	39.0	25.0	64.0	5.2
0000829200	ST.01	50.0	56.0	107.0	3.4
0000829218	ST.02	45.0	57.0	102.0	3.6
0000829226	ST.03	45.0	57.0	102.0	3.6
0000829242	ST.04	45.0	57.0	102.0	3.6
0000829259	ST.05	45.0	57.0	102.0	3.6
0000829267	ST.06	45.0	57.0	102.0	3.6
0000829275	ST.07	45.0	57.0	102.0	3.6
0000829291	ST.08	45.0	56.0	102.0	3.6
0000829309-01	ST.09	46.0	47.0	93.0	3.9
0000829317	T.01	60.0	35.0	95.0	3.8
0000829333-01	T.02	43.0	33.0	77.0	4.4

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 765678M_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 06/10/2017 published by the Department. This document is available at www.basix.nsw.gov.au

This certificate is a revision of certificate number 765678M_02 lodged with the consent authority or certifier on 18 February 2017 with application DA/88/2107.

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: Wednesday, 17 January 2018

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



Project summary

Project name	Lot S1 - Newmarket Green Units_05
Street address	Young Street Randwick 2031
Local Government Area	Randwick City Council
Plan type and plan number	deposited n/a
Lot no.	S1
Section no.	-
No. of residential flat buildings	1
No. of units in residential flat buildings	17
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Project score

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

Certificate Prepared by

Name / Company Name: Efficient Living

ABN (if applicable): 82116346082

Description of project

Project address

Project name	Lot S1 - Newmarket Green Units_05
Street address	Young Street Randwick 2031
Local Government Area	Randwick City Council
Plan type and plan number	deposited n/a
Lot no.	S1
Section no.	-

Project type

No. of residential flat buildings	1
No. of units in residential flat buildings	17
No. of multi-dwelling houses	0
No. of single dwelling houses	0

Site details

Site area (m²)	3346
Roof area (m²)	398
Non-residential floor area (m²)	-
Residential car spaces	21
Non-residential car spaces	-

Common area landscape

Common area lawn (m²)	150.0
Common area garden (m²)	100.0
Area of indigenous or low water use species (m²)	0.0

Assessor details

Assessor number	BDAV/12/1473
Certificate number	0001893310
Climate zone	56

Project score

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

Description of project

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

Residential flat buildings - Building S1 units, 17 dwellings, 5 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)
0.01	2	78.0	0.0	18.0	0.0
1.02	2	86.0	0.0	0.0	0.0
2.02	2	86.0	0.0	0.0	0.0
3.02	2	86.0	0.0	0.0	0.0
4.02	3	127.0	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)
0.02	2	79.0	0.0	53.0	0.0
1.03	1	65.0	0.0	0.0	0.0
2.03	1	65.0	0.0	0.0	0.0
3.03	1	65.0	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)
0.03	1	65.0	0.0	32.0	0.0
1.05	1	58.0	0.0	0.0	0.0
2.05	1	58.0	0.0	0.0	0.0
3.05	1	58.0	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)
1.01	2	78.0	0.0	0.0	0.0
2.01	2	78.0	0.0	0.0	0.0
3.01	2	78.0	0.0	0.0	0.0
4.01	3	104.0	5.0	0.0	0.0

Description of project

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

Common areas of unit building - Building S1 units

Common area	Floor area (m²)
Car park area	776.0
Main Switchroom	12.0
Mech room	8.0
Fire Pumproom	19.0
Hallways - units	73.0

Common area	Floor area (m²)
Lift car (No.1)	-
Waste room	26.0
RW Plant	10.0
Energy Storage	12.0

Common area	Floor area (m²)
Main Comms Room	19.0
Garbage room	20.0
Potable water plant	16.0
Ground floor lobby - units	29.0

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building S1 units

(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 - Building S1 units

(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	-	-	3.5 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
0.01, 0.02, 0.03	central water tank (no. 1)	See central systems	See central systems	yes	-	-	-	-

(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	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, not ducted	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
4.01, 4.02	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	3	1	yes	yes	yes	yes	0	no
0.02, 1.01, 1.02, 2.01, 2.02, 3.01, 3.02	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	2	1	yes	yes	yes	yes	0	no
All other dwellings	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1	1	yes	yes	yes	yes	0	no

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	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.			

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.	✓	✓	✓

Dwelling no.	Thermal loads	
	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
0.01	53.0	19.0
0.02	52.0	28.0
0.03	40.0	25.0
1.01	16.0	22.0
1.02	45.0	22.0
1.03	65.0	22.0
1.05	42.0	27.0
2.01	19.0	16.0

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
2.02	46.0	21.0
2.03	48.0	25.0
2.05	37.0	29.0
3.01	20.0	16.0
3.02	52.0	21.0
3.03	53.0	25.0
3.05	36.0	29.0
4.01	66.0	39.0
All other dwellings	66.0	38.0

(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)	10000.0	To collect run-off from at least: - 300.0 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 250.0 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 area	ventilation (supply + exhaust)	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
Main Comms Room	ventilation supply only	thermostatically controlled	fluorescent	manual on / manual off	No
Main Switchroom	ventilation supply only	thermostatically controlled	fluorescent	manual on / manual off	No
Waste room	ventilation exhaust only	-	fluorescent	motion sensors	No
Garbage room	ventilation supply only	-	fluorescent	motion sensors	No
Mech room	ventilation supply only	interlocked to light	fluorescent	manual on / manual off	No
RW Plant	ventilation supply only	interlocked to light	fluorescent	manual on / manual off	No
Potable water plant	ventilation supply only	interlocked to light	fluorescent	manual on / manual off	No
Fire Pumproom	ventilation supply only	interlocked to light	fluorescent	manual on / manual off	No
Energy Storage	ventilation supply only	interlocked to light	fluorescent	manual on / manual off	No
Ground floor lobby - units	no mechanical ventilation	-	light-emitting diode	zoned switching with motion sensor	No
Hallways - units	no mechanical ventilation	-	light-emitting diode	zoned switching with motion sensor	No

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas-fired boiler	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 6

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): 1.5 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).

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 765605M_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 18/09/2014 published by the Department. This document is available at www.basix.nsw.gov.au

This certificate is a revision of certificate number 765605M_02 lodged with the consent authority or certifier on 18 February 2017 with application DA/88/2017.

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: Friday, 08 September 2017

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



Project summary

Project name	Lot S1 - Newmarket Green Terraces _04
Street address	Young Street Randwick 2031
Local Government Area	Randwick City Council
Plan type and plan number	deposited n/a
Lot no.	S1
Section no.	-
No. of residential flat buildings	0
No. of units in residential flat buildings	0
No. of multi-dwelling houses	22
No. of single dwelling houses	0

Project score

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

Certificate Prepared by

Name / Company Name: Efficient Living

ABN (if applicable): 82116346082

Description of project

Project address

Project name	Lot S1 - Newmarket Green Terraces _04
Street address	Young Street Randwick 2031
Local Government Area	Randwick City Council
Plan type and plan number	deposited n/a
Lot no.	S1
Section no.	-

Project type

No. of residential flat buildings	0
No. of units in residential flat buildings	0
No. of multi-dwelling houses	22
No. of single dwelling houses	0

Site details

Site area (m²)	3346
Roof area (m²)	1566
Non-residential floor area (m²)	0.0
Residential car spaces	19
Non-residential car spaces	0

Common area landscape

Common area lawn (m²)	0.0
Common area garden (m²)	0.0
Area of indigenous or low water use species (m²)	-

Assessor details

Assessor number	BDAV/12/1473
Certificate number	0001893280
Climate zone	56

Project score

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

Description of project

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

Multi-dwelling houses

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)
T01	3	163.0	0.0	38.0	0.0
T06	3	163.0	0.0	38.0	0.0
T10	3	163.0	0.0	106.0	0.0
0.08	2	101.0	0.0	13.0	0.0
ST05	1	39.0	7.0	0.0	0.0
ST09	1	39.0	7.0	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)
T02	3	163.0	0.0	38.0	0.0
T07	3	163.0	0.0	38.0	0.0
0.05	2	101.0	0.0	16.0	0.0
ST01	1	39.0	7.0	0.0	0.0
ST06	1	39.0	7.0	0.0	0.0
ST10	1	39.0	7.0	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)
T03	3	163.0	0.0	38.0	0.0
T08	3	163.0	0.0	38.0	0.0
0.06	2	101.0	0.0	16.0	0.0
ST02	1	39.0	7.0	0.0	0.0
ST07	1	39.0	7.0	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)
T05	3	163.0	0.0	38.0	0.0
T09	3	163.0	0.0	38.0	0.0
0.07	2	101.0	0.0	15.0	0.0
ST03	1	39.0	7.0	0.0	0.0
ST08	1	39.0	7.0	0.0	0.0

No common areas specified.

Schedule of BASIX commitments

1. Commitments for multi-dwelling houses

(a) Dwellings

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

2. Commitments for single dwelling houses

3. 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 multi-dwelling houses

(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	-	-	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
T01, T02, T03, T05, T06, T07, T08, T09, T10, 0.05, 0.06, 0.07, 0.08	central water tank (no. 1)	See central systems	See central systems	yes	-	-	-	-

(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.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.		✓	✓
(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".		✓	
(j) The applicant must install the photovoltaic system specified for the dwelling under the "Photovoltaic system" heading of the "Alternative energy" column of the table below, and connect the system to that dwelling's electrical system.	✓	✓	✓

	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	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, not ducted	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
0.05, 0.06, 0.07, 0.08	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	2	1	yes	yes	yes	yes	0	no
T01, T02, T03, T05, T06, T07, T08, T09, T10	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	3	1	yes	yes	yes	yes	0	no
All other dwellings	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1-phase airconditioning 3 Star (new rating)	1	1	yes	yes	yes	yes	0	no

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	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	-	-	-	no	no

Alternative energy	
Dwelling no.	Photovoltaic system (min rated electrical output in peak kW)
T01, T02	1.0

	Alternative energy
Dwelling no.	Photovoltaic system (min rated electrical output in peak kW)
All other dwellings	-

(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/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
T01	60.0	35.0
T10	53.0	39.0
0.05	65.0	29.0
0.06	58.0	31.0
0.07	36.0	27.0
0.08	39.0	25.0
ST01	50.0	56.0
ST09	57.0	57.0
ST10	46.0	47.0
T02, T03, T05, T06, T07, T08, T09	43.0	33.0
All other dwellings	45.0	57.0

	Construction of floors and walls				
Dwelling no.	Concrete slab on ground(m²)	Suspended floor with open subfloor (m²)	Suspended floor with enclosed subfloor (m²)	Suspended floor above garage (m²)	Primarily rammed earth or mudbrick walls
0.05,0.06,0.07,0.08	-	-	-	-	No
T01,T02,T03,T05,T06,T07,T08,T09,T10	10	-	-	-	No
All other dwellings	4	-	-	43	No

3. 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

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: - 400.0 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 0.0 square metres of common landscaped area 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.	✓	✓	✓

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas-fired boiler	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)

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).