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NatHERS and BASIX Assessment



Urban Link Proposed Residential Development

Panthers North Precinct

Stage 2b: Building D and E

To be built at **Panthers North Precinct, Penrith NSW 2750**

Issue	File Ref	Description	Author	Date
A	18-0785	NatHERS and BASIX Assessment	HE/DG/NM	16/07/18
B	19-0161	Update NatHERS and BASIX Assessment	HE	11/03/19
C	19-0487	Update NatHERS and BASIX Assessment	AM	11/06/19
D	20-1143	Update NatHERS and BASIX Assessment	FM	18/12/20

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



Sustainable Building Consultants

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Introduction

Efficient Living has investigated the estimated thermal comfort, water and energy usage of the proposed development to be built at Panthers North Precinct NSW 2750.

Heating and cooling loads for the development have been determined using BERS Pro Plus 4.3 thermal comfort simulation software. The report is based on the architectural drawings provided by Turner architects. For further details, refer to the individual BASIX certificates(s) and Efficient Living's inclusions summary respectively.

This report is based on the following plans prepared by Urban Link.: S4.55-101, S4.55-102, S4.55-103, S4.55-104, S4.55-105, S4.55-106, S4.55-107, S4.55-201, S4.55-202 & S4.55-1401.

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 pass or fail is required for the thermal comfort section and a minimum required target of 35% 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 can have a significant 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 Pro Plus V4.3 thermal comfort simulation software. This calculates the expected level of energy required 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 applied. Accompanying these individual caps are average heating and cooling caps applied to the whole development. The average caps are lower, or harder to comply with, than the individual unit caps.

Energy

The proposed development has achieved the energy target of 35% 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 below have been incorporated in each unit to allow them to reach their environmental sustainability targets.

Thermal Comfort

Average heating loads are 19% below allowable BASIX targets.

Average cooling loads are 26% below allowable BASIX targets.

Glazing Doors/Windows

Aluminium framed clear performance glazing:

A – awning windows + hinged glazed doors

U-Value: 4.80 (equal to or lower than) SHGC: 0.51 (±10%)

B – sliding doors/windows + fixed glazing + louvre windows

U-Value: 4.80 (equal to or lower than) SHGC: 0.59 (±10%)

Upgrades as per Assessor Certificate

Aluminium framed double performance glazing as per assessor certificate:

U-Value: 4.10 (equal to or lower than) SHGC: 0.52 (±10%)

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

Roof

Concrete roof no insulation

External Colour: Default colour modelled

Ceiling

Plasterboard ceiling, R4.0 insulation (insulation only value) to unit D.402, D.501 and D.507 as per Assessor Certificate



Plasterboard ceiling, R2.5 insulation (insulation only value) to all other units were exposed roof and terrace above;
Plasterboard ceiling, R1.5 insulation (insulation only value) where balconies are above
Plasterboard ceiling, no insulation where neighbouring units are above

Ceiling Penetrations

Assumed sealed LED downlights every 1/2.5m²

External Wall

Brick veneer with R2.0 insulation (insulation only value)
Lightweight spandrel with R2.0 insulation

External Colour:

Default colour modelled

Inter tenancy walls

75 mm Hebel power panel wall between neighbours, no insulation required
75 mm Hebel power panel wall with R1.2 insulation to corridor walls and R1.7 insulation as per Assessor Certificate
200mm concrete wall with R1.2 insulation to lift shafts and fire stairs and R1.7 insulation as per Assessor Certificate
Acoustic insulation as required

Walls within dwellings

Plasterboard on studs - no insulation

Floors

Concrete with a minimum R1.0 insulation (insulation only value) required to units with garage and service rooms below and R2.0 insulation to unit E.105 as per Assessor Certificate
Concrete - suspended open subfloor with R1.2 insulation required as per Assessor Certificate
Concrete between levels no insulation required.

Floor coverings

Carpet to bedrooms, tiles to bathrooms and laundry, timber elsewhere

External Shading

External shading screens and fins as per stamped documentation



BASIX water inclusions

Score 40/40

Fixtures within units

Showerheads: Mid flow (>6L but <=7.5 L/min)

Toilets: 4.0 star

Kitchen taps: 5.0 star

Bathroom vanity taps: 5.0 star

Fixtures within common areas

Toilets: 4.0 star

Bathroom vanity taps: 5.0 star

Appliances within units

Dishwashers: 4.0 star

Common pool

Volume: 161kL in total (131 adult and 30 kids pool)

Central rainwater storage

Tank size: 10,000L

Collecting from 1400m² roof area

Connected to outdoor tap for irrigation of landscaping and two car wash bays

Fire sprinkler test water

No BASIX restriction

BASIX energy inclusions

Score 35/35

Hot water system

Centralised gas instantaneous 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 within units

Gas cooktop & electric oven

Dishwashers: 3.5 star

Clothes dryers: 2.0 star

Well ventilated fridge space

Heating and cooling within units

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

A minimum efficiency of EER (COP) 3.5 – 4.0 is required for cooling; and

A minimum efficiency of EER (COP) > 4.0 is required for heating.

Air conditioning day-night zoned between bedrooms and living areas

Artificial lighting within units

All light fittings within each room are to have LED fixtures installed

Ventilation within units

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

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

Kitchen range hood – Individual fan, ducted to roof or fascade – manual on / manual off switch

Ventilation to common areas

Car park area – supply & exhaust air with a carbon monoxide monitor & VSD fan

Turntable – supply & exhaust air with a carbon monoxide monitor & VSD fan

Garbage rooms – Exhaust air, running continuously

Cold water pump room – Exhaust only continuous

Fire pump room – Supply only in fire mode

Car park exhaust – Supply only CO monitoring system (controlled)

Car park supply – Supply only CO monitoring system (controlled)

Cleaners WC – Exhaust only continuous

Store – Exhaust only continuous



Pool plant - Exhaust only continuous

Main comms room - AC cooling mode continuous

Main switch room - Supply only interlocked to light

Ground floor lobbies and hallways - Supply only time clock or BMS controlled

(Please note: Any air-conditioned commons areas that are not exclusive to residents must comply with NCC Section J glazing and insulation requirements. Independent reports should be requested prior to CC if relevant)

Artificial lighting to common areas

Car park area - LED lights with zoned switching and motion sensors

Lifts - LED lights connected to lift call button

Garbage rooms - LED lights with motion sensors

Turntable - LED with timeclock

Fire pump room- LED lights with manual on / manual off switch

Cold water pump room - LED lights with manual on / manual off switch

Car park exhaust - LED lights with motion sensors

Car park supply - LED lights with motion sensors

Cleaner's toilet - LED lights with motion sensors

Pool plant - LED lights with motion sensors

Main comms room - LED lights with motion sensors

Main switch room - LED lights with motion sensors

Store - LED lights with motion sensors

Ground floor lobbies and hallways - LED with zoned switching and motion sensors

Common pool

Electric heat pump gas boosted

Pump controlled by a timer

Alternative energy

50kW Photovoltaic system

Thermal Comfort Results

Proposed Residential Development

ESQ1818: Stage 2b Building D E

Issued in accordance with BASIX Thermal Comfort Simulation Method

Certificate # 0005531280				Accreditation # HERA10033 & VIC/BDIV/12/1473			
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)		
Building D							
D101	1	61	0	61	50.2	5.1	Glazing upgrade throughout
D102	2	75	0	43.1	61.9	5.3	Glazing upgrade throughout
D103	2	82	0	49.2	44.8	5.8	None
D104	1	54	0	35.8	32.8	6.9	None
D105A	1	56	0	52.4	48.1	5.4	None
D105B	1	62	0	47.2	36.7	6.2	None
D.106	1	78	0	57.2	34.2	5.9	Glazing upgrade throughout
D107	1	45	0	49.4	28.5	6.4	None
D108	2	71	0	53.4	33.9	5.9	None
D109	2	77	0	40.6	44.1	6.2	None
D110	2	84	0	49.5	44.4	5.8	None
D111	1	61	0	55.7	34	5.9	R1.0 insulation to suspended floor where garage is below
D112	2	77	0	55.9	30.5	6.1	Glazing upgrade throughout R1.0 insulation to suspended floor where garage is below
D201	1	61	0	61	56.2	4.9	None
D202	2	75	0	34.2	62.1	5.7	Glazing upgrade throughout
D203	2	82	0	36.7	38.9	6.6	None
D204	2	82	0	49.3	38.2	5.9	None
D205A	1	56	0	38.7	50.3	5.9	None
D205B	1	62	0	36.6	38	6.7	None
D206	2	78	0	43.1	37.6	6.4	Glazing upgrade throughout
D207	2	80	0	59.5	48.7	5.2	None
D208	2	85	0	47	21.3	6.9	R1.2 insulation to open subfloor
D209	2	78	0	48.6	45.1	6.7	None
D210	2	82	0	49.3	38.2	5.9	None
D211	2	77	0	32.3	46.5	6.4	None
D212	2	84	0	41.3	47.6	5.9	None
D213	1	61	0	53.6	36.2	5.9	Glazing upgrade throughout
D301	1	61	0	61.4	33.1	5.7	None
D302	2	75	0	33.1	61.7	5.7	Glazing upgrade throughout
D303	2	82	0	32.9	42.9	6.6	None
D304	2	82	0	44.2	38.6	6.3	None
D305A	1	56	0	37.4	50.8	5.9	None
D305B	1	62	0	35.9	38.1	6.7	None

Thermal Comfort Results

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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)		
D306	2	78	0	43.7	36.8	6.4	Glazing upgrade throughout
D307	2	77	0	59.7	34.4	5.8	Glazing upgrade to Bedroom 2
D308	2	85	0	25.6	25.9	7.7	None
D309	2	78	0	22.7	47.5	6.9	None
D310	2	82	0	23.3	31	7.6	None
D311	2	77	0	32.3	46.6	6.4	None
D312	2	84	0	41.8	46.8	5.9	None
D313	1	61	0	54.2	35.5	5.9	Glazing upgrade throughout
D401	1	61	0	56.7	54.3	5.1	Glazing upgrade throughout
D402	3	205	0	29.5	62.8	5.8	Glazing upgrade throughout R4.0 ceiling insulation
D404	2	82	0	58.6	36.2	5.7	None
D406	4	208	0	48.1	32.4	6.4	None
D407	2	77	0	62.6	30.1	5.8	Glazing upgrade to Bedroom 2
D408	2	85	0	25.8	23.5	7.8	None
D409	2	78	0	21.7	49.2	6.8	None
D410	2	82	0	23.4	28.5	7.7	None
D411	2	77	0	34.5	41.7	6.6	None
D412	2	81	0	39.9	53.9	5.8	None
D413	1	61	0	57.1	32.4	5.9	Glazing upgrade throughout
D501	2	77	0	60	26	6.1	Glazing upgrade throughout R4.0 ceiling insulation
D502	1	50	0	48	56.3	5.3	Glazing upgrade throughout
D503	3	106	0	58.2	41.2	5.4	Glazing upgrade throughout
D504	2	82	0	43.3	32.2	6.6	Glazing upgrade throughout
D505	2	77	0	39.5	44.2	6.2	None
D506	2	81	0	56.9	51.9	5.2	None
D507	1	61	0	62.1	33.6	5.7	Glazing upgrade throughout R4.0 ceiling insulation
Building E							
E101	1	55	0	58.1	31.6	5.9	R1.0 insulation to suspended floor where garage is below
E102	3	102	0	58.1	45.9	5.4	Glazing upgrade throughout
E103	2	77	0	31.4	38.1	6.9	None
E104	1	60	0	52	32.5	6.2	None

Thermal Comfort Results

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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)		
E105	1	57	0	62.3	41.8	5.4	Glazing upgrade throughout R2.0 insulation to suspended floor where garage is below R1.7 insulation to walls facing hallways, lifts & firestairs
E106	2	86	0	58.2	36.3	5.7	Glazing upgrade throughout R1.0 insulation to suspended floor where garage is below
E107	2	75	0	42.8	50.2	5.8	None
E108	1	59	0	34.1	46.5	6.4	None
E109	2	76	0	53.3	58.5	5	Glazing upgrade throughout
E110	2	70	0	58.8	28.4	5.9	Glazing upgrade throughout R1.0 insulation to suspended floor where garage is below R1.7 insulation to walls facing hallways, lifts & firestairs
E201	3	113	0	61.1	43.1	5.4	Glazing upgrade to west facing window in the living area
E202	3	102	0	35.1	43	6.4	Glazing upgrade throughout
E203	2	77	0	22	45.8	6.9	None
E204	1	60	0	43	34.3	6.4	None
E206	3	96	0	41.6	33.5	6.6	Glazing upgrade throughout
E207	3	75	0	36.2	51.3	5.9	None
E208	1	59	0	29.1	53.9	6.3	None
E209	2	76	0	41.4	59.1	5.4	Glazing upgrade throughout
E210	2	77	0	45.2	26.4	6.8	Glazing upgrade throughout
E301	3	113	0	59.8	46.7	5.3	Glazing upgrade to west facing window in the living area
E302	2	102	0	35.1	43.1	6.4	Glazing upgrade throughout
E303	2	77	0	22.4	45.7	6.9	None
E304	1	60	0	43.3	34.5	6.4	None
E306	3	94	0	38.9	34.2	6.7	Glazing upgrade throughout
E307	3	75	0	36.1	51.4	5.9	None
E308	1	54	0	31.5	37.5	6.9	None
E309	2	76	0	41.9	58.7	5.4	Glazing upgrade throughout
E310	2	77	0	45.7	26.3	6.8	Glazing upgrade throughout
E401	3	113	0	63	40.7	5.4	Glazing upgrade throughout
E402	3	102	0	51.9	39.6	5.9	Glazing upgrade throughout

Thermal Comfort Results

Proposed Residential Development

ESQ1818: Stage 2b Building D E

Issued in accordance with BASIX Thermal Comfort Simulation Method

Certificate # 0005531280				Accreditation # HERA10033 & VIC/BDAV/12/1473			
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)		
E403	2	77	0	32.8	39.5	6.8	None
E404	1	60	0	56.8	34.4	5.9	None
E406	3	94	0	54.4	34.3	5.9	Glazing upgrade throughout
E407	3	140	0	44.7	42.9	5.9	None
E409	2	76	0	55.8	47.3	5.4	Glazing upgrade throughout
E410	2	77	0	61.1	30.8	5.8	Glazing upgrade throughout

Nationwide House Energy Rating Scheme* — Class 2 summary



Certificate number: **0005531280**

Certificate Date:

18 Dec 2020

★ Average Star rating: **6.1**

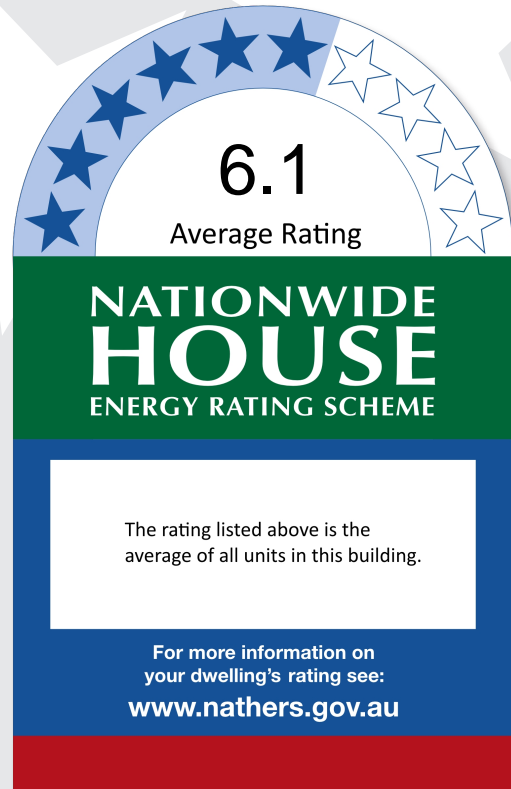
Assessor details

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 v4.3.0.2c (3.13)**
BERS Pro v4.3.0.2d (3.13)
AAO: **BDAV, HERA**

Dwelling details

Street: **Panthers North Precinct**
Suburb: **Penrith**
State: **NSW**
Postcode: **2750**

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
0002910446-02	D.101	61.0	50.2	111.2	5.1
0002910479-02	D.102	43.1	61.9	105.0	5.3
0002910503-02	D.103	49.2	44.8	94.0	5.8
0002910537-02	D.104	35.8	32.8	68.6	6.9
0003679172-01	D.106	57.2	34.2	91.4	5.9
0002910594-02	D.107	49.4	28.5	77.9	6.4
0002910628-02	D.108	53.4	33.9	87.3	5.9
0002910651-02	D.109	40.6	44.1	84.7	6.2
0005529482-01	D.110	49.5	44.4	94.0	5.8
0005529516-01	D.111	55.7	34.0	89.7	5.9
0005529540	D.112	55.9	30.5	86.3	6.1
0002910776-02	D.201	61.0	56.2	117.2	4.9
0002910800-02	D.202	34.2	62.1	96.4	5.7
0002910834-02	D.203	36.7	38.9	75.6	6.6
0002910867-02	D.204	49.3	38.2	87.5	5.9

* Nationwide House Energy Rating Scheme (NatHERS) is an initiative of the Australian, state and territory governments.

For more details see www.nathers.gov.au

Nationwide House Energy Rating Scheme* - Class 2 summary

Certificate number: **0005531280**

Certificate Date:

18 Dec 2020

★ Average Star rating: **6.1**



Summary of all dwellings continued

Certificate Details

Certificate number	Unit number	Heating load	Cooling load	Total load	Star Rating
0002910925-02	D.206	43.1	37.6	80.7	6.4
0002910958-02	D.207	63.6	53.0	116.6	4.9
0002910982-02	D.208	47.0	21.3	68.4	6.9
0002911014-02	D.209	28.6	45.1	73.8	6.7
0002910461-02	D.210	49.3	38.2	87.5	5.9
0002910495-02	D.211	32.3	46.5	78.8	6.4
0005529870	D.212	41.3	47.6	88.9	5.9
0005529649-01	D.213	53.6	36.2	89.9	5.9
0002910602-02	D.301	61.4	56.0	117.4	4.9
0002910636-02	D.302	33.1	61.7	94.8	5.7
0002910669-02	D.303	32.9	42.6	75.5	6.6
0002910693-02	D.304	44.2	38.6	82.8	6.3
0002910750-02	D.306	43.7	36.8	80.5	6.4
0005529730	D.307	59.7	34.4	94.1	5.8
0002910818-02	D.308	25.6	25.9	51.6	7.7
0002910842-02	D.309	22.7	47.5	70.1	6.9
0002910875-02	D.310	23.3	31.0	54.3	7.6
0002910909-02	D.311	32.3	46.6	78.8	6.4
0005529375-01	D.312	41.8	46.8	88.7	5.9
0005529409	D.313	54.2	35.5	89.7	5.9
0002911022-02	D.401	56.7	54.3	111.0	5.1
0005529441	D.402	29.5	62.8	92.3	5.8
0002910511-02	D.404	58.6	36.2	94.8	5.7
0005529474	D.406	48.1	32.4	80.5	6.4
0005529490-01	D.407	62.6	30.1	92.7	5.8
0002910644-02	D.408	25.8	23.5	49.3	7.8
0002910677-02	D.409	21.7	49.2	70.9	6.8
0002910701-02	D.410	23.4	28.5	51.9	7.7
0002910727-02	D.411	34.5	41.7	76.2	6.6
0002910768-02	D.412	39.9	53.9	93.8	5.8
0005529524-01	D.413	57.1	32.4	89.6	5.9
0005529565	D.501	60.0	26.0	86.1	6.1
0003679198-01	D.502	48.0	56.3	104.2	5.3
0003679206-01	D.503	58.2	41.2	99.4	5.4
0003679214-01	D.504	43.3	32.2	75.5	6.6
0003926656	D.505	44.9	44.8	89.7	5.9
0003679222-01	D.506	56.9	51.9	108.8	5.2
0005529599	D.507	62.1	33.6	95.7	5.7
0005529425	D.105A	52.4	48.1	100.5	5.4
0005529573	D.205A	38.7	50.3	89.0	5.9
0005529664	D.305A	37.4	50.8	88.3	5.9
0005529458	D.105B	47.2	36.7	83.9	6.2
0005529607	D.205B	36.6	38.0	74.5	6.7

* Nationwide House Energy Rating Scheme (NatHERS) is an initiative of the Australian, state and territory governments. For more details see www.nathers.gov.au

Nationwide House Energy Rating Scheme* - Class 2 summary



Certificate number: **0005531280**

Certificate Date:

18 Dec 2020

★ Average Star rating: **6.1**

Summary of all dwellings continued

Certificate Details

Certificate number	Unit number	Heating load	Cooling load	Total load	Star Rating
0005529706	D.305B	35.9	38.1	74.0	6.7
0005529615-01	E.101	58.1	31.6	89.7	5.9
0002911071-02	E.102	58.1	45.9	104.0	5.4
0005529631-01	E.103	31.4	38.1	69.5	6.9
0002911139-02	E.104	52.0	32.5	84.5	6.2
0005529672	E.105	62.3	41.8	104.1	5.4
0005529714	E.106	58.2	36.3	94.6	5.7
0002911220-02	E.107	42.8	50.2	93.1	5.8
0005529722	E.108	34.1	46.5	80.6	6.4
0005529383-01	E.109	53.3	58.5	111.8	5
0005529417	E.110	58.8	28.4	87.2	5.9
0005529433	E.201	61.1	43.1	104.1	5.4
0002911402-02	E.202	35.1	43.0	78.1	6.4
0005529466	E.203	22.0	45.8	67.8	6.9
0002911444-02	E.204	43.0	34.3	77.4	6.4
0002911055-02	E.206	41.6	33.5	75.0	6.6
0002911097-02	E.207	36.2	51.3	87.5	5.9
0002911121-02	E.208	29.1	53.9	83.0	6.3
0005529508-01	E.209	41.4	59.1	100.6	5.4
0002911188-02	E.210	45.2	26.3	71.6	6.8
0005529532	E.301	59.8	46.7	106.5	5.3
0002911261-02	E.302	35.1	43.1	78.1	6.4
0005529557	E.303	22.4	45.7	68.1	6.9
0002911329-03	E.304	43.3	34.5	77.7	6.4
0002911386-02	E.306	38.9	34.2	73.1	6.7
0002911410-02	E.307	36.1	51.4	87.5	5.9
0002911428-02	E.308	31.5	37.5	69.0	6.9
0005529581	E.309	41.9	58.7	100.7	5.4
0002911477-02	E.310	45.7	26.3	71.9	6.8
0005529623-01	E.401	63.0	40.7	103.7	5.4
0002911113-02	E.402	51.9	39.6	91.5	5.9
0005529656-01	E.403	32.8	39.5	72.2	6.8
0002911170-03	E.404	56.8	34.4	91.2	5.9
0002911246-02	E.406	54.4	34.3	88.7	5.9
0005529680	E.407	44.7	42.9	87.7	5.9
0005529698	E.409	55.8	47.3	103.1	5.4
0002911360-02	E.410	61.1	30.8	91.9	5.8

* Nationwide House Energy Rating Scheme (NatHERS) is an initiative of the Australian, state and territory governments. For more details see www.nathers.gov.au

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 705414M_07

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

Secretary

Date of issue: Thursday, 26 August 2021

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






Planning,
Industry &
Environment

Project summary		
Project name	ESQ 1818 - Building D & E_07	
Street address	65 Mulgoa Road Penrith 2750	
Local Government Area	Penrith City Council	
Plan type and plan number	deposited 812335	
Lot no.	1021	
Section no.	-	
No. of residential flat buildings	2	
No. of units in residential flat buildings	95	
No. of multi-dwelling houses	0	
No. of single dwelling houses	0	
Project score		
Water	✔ 40	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 35	Target 35

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

Description of project

Project address	
Project name	ESQ 1818 - Building D & E_07
Street address	65 Mulgoa Road Penrith 2750
Local Government Area	Penrith City Council
Plan type and plan number	deposited 812335
Lot no.	1021
Section no.	-
Project type	
No. of residential flat buildings	2
No. of units in residential flat buildings	95
No. of multi-dwelling houses	0
No. of single dwelling houses	0
Site details	
Site area (m ²)	66565
Roof area (m ²)	2996
Non-residential floor area (m ²)	0.0
Residential car spaces	129
Non-residential car spaces	0

Common area landscape		
Common area lawn (m ²)	0.0	
Common area garden (m ²)	1255.9	
Area of indigenous or low water use species (m ²)	0.0	
Assessor details		
Assessor number	HERA10033	
Certificate number	0005531280	
Climate zone	28	
Ceiling fan in at least one bedroom	No	
Ceiling fan in at least one living room or other conditioned area	No	
Project score		
Water	 40	Target 40
Thermal Comfort	 Pass	Target Pass
Energy	 35	Target 35

Description of project

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

Residential flat buildings - Building D, 59 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)
D101	1	61.0	0.0	0.0	0.0
D107	1	45.0	0.0	0.0	0.0
D112	2	77.0	0.0	0.0	0.0
D206	2	78.0	0.0	0.0	0.0
D211	2	77.0	0.0	0.0	0.0
D303	2	82.0	0.0	0.0	0.0
D309	2	78.0	0.0	0.0	0.0
D401	1	61.0	0.0	0.0	0.0
D408	2	85.0	0.0	0.0	0.0
D413	1	61.0	0.0	0.0	0.0
D505	2	77.0	0.0	0.0	0.0
D205A1	56.0	0.0	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)
D102	2	75.0	0.0	0.0	0.0
D108	2	71.0	0.0	0.0	0.0
D201	1	61.0	0.0	0.0	0.0
D207	2	80.0	0.0	0.0	0.0
D212	2	84.0	0.0	0.0	0.0
D304	2	82.0	0.0	0.0	0.0
D310	2	82.0	0.0	0.0	0.0
D402	3	205.0	0.0	0.0	0.0
D409	2	78.0	0.0	0.0	0.0
D501	2	77.0	0.0	0.0	0.0
D506	2	81.0	0.0	0.0	0.0
D205B1	62.0	0.0	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)
D103	2	82.0	0.0	0.0	0.0
D109	2	77.0	0.0	0.0	0.0
D202	2	75.0	0.0	0.0	0.0
D208	2	85.0	0.0	0.0	0.0
D213	1	61.0	0.0	0.0	0.0
D306	2	78.0	0.0	0.0	0.0
D311	2	77.0	0.0	0.0	0.0
D404	2	82.0	0.0	0.0	0.0
D410	2	82.0	0.0	0.0	0.0
D502	1	50.0	0.0	0.0	0.0
D507	1	61.0	0.0	0.0	0.0
D305A1	56.0	0.0	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)
D104	1	54.0	0.0	0.0	0.0
D110	2	84.0	0.0	0.0	0.0
D203	2	82.0	0.0	0.0	0.0
D209	2	78.0	0.0	0.0	0.0
D301	1	61.0	0.0	0.0	0.0
D307	2	77.0	0.0	0.0	0.0
D312	2	84.0	0.0	0.0	0.0
D406	4 or more bedrooms	208.0	0.0	0.0	0.0
D411	2	77.0	0.0	0.0	0.0
D503	3	106.0	0.0	0.0	0.0
D105A1	56.0	0.0	0.0	0.0	0.0
D305B1	62.0	0.0	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)
D106	1	78.0	0.0	0.0	0.0
D111	1	61.0	0.0	0.0	0.0
D204	2	82.0	0.0	0.0	0.0
D210	2	82.0	0.0	0.0	0.0
D302	2	75.0	0.0	0.0	0.0
D308	2	85.0	0.0	0.0	0.0
D313	1	61.0	0.0	0.0	0.0
D407	2	77.0	0.0	0.0	0.0
D412	2	81.0	0.0	0.0	0.0
D504	2	82.0	0.0	0.0	0.0
D105B1	62.0	0.0	0.0	0.0	0.0

Residential flat buildings - Building E, 36 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)
E101	1	55.0	0.0	0.0	0.0
E106	2	86.0	0.0	0.0	0.0
E201	3	113.0	0.0	0.0	0.0
E207	3	75.0	0.0	0.0	0.0
E302	2	102.0	0.0	0.0	0.0
E308	1	54.0	0.0	0.0	0.0
E403	2	77.0	0.0	0.0	0.0
E410	2	77.0	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)
E102	3	102.0	0.0	0.0	0.0
E107	2	75.0	0.0	0.0	0.0
E202	3	102.0	0.0	0.0	0.0
E208	1	59.0	0.0	0.0	0.0
E303	2	77.0	0.0	0.0	0.0
E309	2	76.0	0.0	0.0	0.0
E404	1	60.0	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)
E103	2	77.0	0.0	0.0	0.0
E108	1	59.0	0.0	0.0	0.0
E203	2	77.0	0.0	0.0	0.0
E209	2	76.0	0.0	0.0	0.0
E304	1	60.0	0.0	0.0	0.0
E310	2	77.0	0.0	0.0	0.0
E406	2	94.0	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)
E104	1	60.0	0.0	0.0	0.0
E109	2	76.0	0.0	0.0	0.0
E204	1	60.0	0.0	0.0	0.0
E210	2	77.0	0.0	0.0	0.0
E306	2	94.0	0.0	0.0	0.0
E401	3	113.0	2.0	0.0	0.0
E407	3	140.0	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)
E105	1	57.0	0.0	0.0	0.0
E110	2	70.0	0.0	0.0	0.0
E206	2	96.0	0.0	0.0	0.0
E301	3	113.0	0.0	0.0	0.0
E307	3	75.0	0.0	0.0	0.0
E402	3	102.0	0.0	0.0	0.0
E409	2	76.0	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 - Building D

Common area	Floor area (m ²)	Common area	Floor area (m ²)
Lift car (No.1)	-	Lift car (No.2)	-

Common areas of unit building - Building E

Common area	Floor area (m ²)	Common area	Floor area (m ²)
Lift car (No.3)	-	Lift car (No.4)	-

Common areas of the development (non-building specific)

Common area	Floor area (m ²)	Common area	Floor area (m ²)	Common area	Floor area (m ²)
Car park area	4700.0	Turntable garage	200.0	Garbage/Chute/ room	235.0
Car park supply	34.0	cleaners toilet	7.0	Main comms room	16.0
Main switch room	12.0	Pool plant	36.2	Cold water pump	10.46
Car park exhaust	11.0	Storage + Bulky Store	82.0	Fire pump room	29.6
Hallways and lobby's	750.0				

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building D

(a) Dwellings

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

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for Residential flat buildings - Building E

(a) Dwellings

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

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

3. Commitments for multi-dwelling houses

4. Commitments for single dwelling houses

5. 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 D

(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: <ul style="list-style-type: none"> (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.	✓	✓	✓

Dwelling no.	Fixtures					Appliances		Individual pool				Individual spa		
	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	-	-	-	-	-	-	-

Dwelling no.	Alternative water source							
	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	central hot water system 1	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
D406	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	4 (dedicated)	3 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
D402, D503	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	3 (dedicated)	2 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
D101, D104, D106, D107, D111, D201, D213, D301, D313, D401, D413, D502, D507, D105A, D105B, D205A, D205B, D305A, D305B	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1 (dedicated)	2 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
All other dwellings	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	2 (dedicated)	2 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	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	3.5 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.	✓	✓	✓

Dwelling no.	Thermal loads	
	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
D101	61.0	50.2
D102	43.1	61.9
D103	49.2	44.8
D104	35.8	32.8
D106	57.2	34.2
D107	49.4	28.5
D108	53.4	33.9
D109	40.6	44.1
D110	49.5	44.4
D111	55.7	34.0
D112	55.9	30.5
D201	61.0	56.2
D202	34.2	62.1
D203	36.7	38.9
D206	43.1	37.6
D207	59.5	48.7
D208	47.0	21.3
D209	48.6	45.1
D211	32.3	46.5
D212	41.3	47.6
D213	53.6	36.2
D301	61.4	33.1
D302	33.1	61.7
D303	32.9	42.9
D304	44.2	38.6
D306	43.7	36.8
D307	59.7	34.4

Dwelling no.	Thermal loads	
	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
D308	25.6	25.9
D309	22.7	47.5
D310	23.2	31.0
D311	32.3	46.6
D312	41.8	46.8
D313	54.2	35.5
D401	56.7	54.3
D402	29.5	62.8
D404	58.6	36.2
D406	48.1	32.4
D407	62.6	30.1
D408	25.8	23.5
D409	21.7	49.2
D410	23.4	28.5
D411	34.5	41.7
D412	39.9	53.9
D413	57.1	32.4
D501	60.0	26.0
D502	48.0	56.3
D503	58.2	41.2
D504	43.3	32.2
D505	44.9	44.8
D506	56.9	51.9
D507	62.1	33.6
D105A	52.4	48.1
D105B	47.2	36.7
D205A	38.7	50.3

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
D205B	36.6	38.0
D305A	37.4	50.8
D305B	35.9	38.1
All other dwellings	49.3	38.2

(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	4 star	5 star	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.	✓	✓	✓

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
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

Central energy systems	Type	Specification
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 6
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 5

2. Commitments for Residential flat buildings - Building E

(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.	✓	✓	✓

Dwelling no.	Fixtures					Appliances		Individual pool				Individual spa		
	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	-	-	-	-	-	-	-

Dwelling no.	Alternative water source							
	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	central hot water system 1	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
E101, E104, E105, E108, E204, E208, E304, E308, E404	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1 (dedicated)	2 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
E102, E201, E202, E207, E301, E307, E401, E402, E407	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	3 (dedicated)	2 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
All other dwellings	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER 3.5 - 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	1-phase airconditioning EER > 4.0 (zoned)	2 (dedicated)	2 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	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	3.5 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/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
E101	58.1	31.6
E102	58.1	45.9
E103	31.4	38.1
E104	52.0	32.5

Dwelling no.	Thermal loads	
	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
E105	62.3	41.8
E106	58.2	36.3
E107	42.8	50.2
E108	34.1	46.5
E109	53.3	58.5
E110	58.8	28.4
E201	61.1	43.1
E202	35.1	43.0
E203	22.0	45.8
E204	43.0	34.3
E206	41.6	33.5
E207	36.2	51.3
E208	29.1	53.9
E209	41.4	59.1
E210	45.2	26.3
E301	59.8	46.7
E302	35.1	43.1
E303	22.4	45.7
E304	43.3	34.5
E306	38.9	34.2
E307	36.1	51.4
E308	31.5	37.5
E309	41.9	58.7
E310	45.7	26.3
E401	63.0	40.7
E402	51.9	39.6
E403	32.8	39.5

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
E404	56.8	34.4
E406	54.4	34.3
E407	44.7	42.9
E409	55.8	47.3
All other dwellings	61.1	30.8

(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	4 star	5 star	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.	✓	✓	✓

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
Lift car (No.3)	-	-	light-emitting diode	connected to lift call button	No
Lift car (No.4)	-	-	light-emitting diode	connected to lift call button	No

Central energy systems	Type	Specification
Lift (No. 3)	gearless traction with V V V F motor	Number of levels (including basement): 5
Lift (No. 4)	gearless traction with V V V F motor	Number of levels (including basement): 5

5. 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	4 star	5 star	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: - 1400.0 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 1255.9 square metres of common landscaped area on the site - car washing in 2 car washing bays on the site

Central systems	Size	Configuration	Connection (to allow for...)
Pool (No. 1)	Volume: 161.0 kLs	Location: Other Pool shaded: no	-
Fire sprinkler system (No. 1)	-	-	-

(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	light-emitting diode	zoned switching with motion sensor	No
Turntable garage	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	time clocks	No
Garbage/Chute/ room	ventilation exhaust only	-	light-emitting diode	motion sensors	No
Car park supply	ventilation supply only	thermostatically controlled	light-emitting diode	motion sensors	No
cleaners toilet	ventilation exhaust only	none ie. continuous	light-emitting diode	motion sensors	No
Main comms room	air conditioning system	none ie. continuous	light-emitting diode	motion sensors	No
Main switch room	ventilation supply only	none ie. continuous	light-emitting diode	motion sensors	No
Pool plant	ventilation exhaust only	none ie. continuous	light-emitting diode	motion sensors	No
Cold water pump	ventilation exhaust only	none ie. continuous	light-emitting diode	manual on / manual off	No
Car park exhaust	ventilation supply only	thermostatically controlled	light-emitting diode	motion sensors	No

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
Storage + Bulky Store	ventilation exhaust only	none ie. continuous	light-emitting diode	motion sensors	No
Fire pump room	ventilation supply only	none ie. continuous	light-emitting diode	manual on / manual off	No
Hallways and lobby's	no mechanical ventilation	-	light-emitting diode	zoned switching with motion sensor	No

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas instantaneous	Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 50.0 peak kW
Pool (No. 1)	Heating source: electric heat pump	Pump controlled by timer: yes
Other	Building management system installed?: yes	-

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).