efficient LIVING

NatHERS and BASIX Assessment

Frasers Property Australia
Proposed Residential Development

To be built at **Shell Cove Precinct C2**

Issue	File Ref	Description	Author	Date
A	21-1878	NatHERS and BASIX Assessment	NR	17/09/2021
B	22-2727	NatHERS and BASIX Assessment update	NR	01/02/2022
B	-	BASIX update	NR	09/02/2022
C	22-3132R	NatHERS and BASIX Assessment update	PV	16/05/2022

This report has been prepared by Efficient Living Pty Ltd on behalf of our client Frasers Property Australia 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
p. 02 9970 6181 **e.** admin@efficientliving.com.au
www.efficientliving.com.au

17 May 2022

Frasers Property Australia
Shell Cove Precinct C2

Report Contact:	Nicholas Roberts	License Holder:	Tracey Cools
Email:	nicholas@efficientliving.com.au	Accreditation Number:	HERA10033

Prepared For:

Client Name:	Frasers Property Australia	Level 3, 1C Homebush Bay Drive
Client Contact:	Kate Isaacs	Rhodes, NSW 2138
Client Email:	kate.isaacs@fraserspropery.com.au	97672568

Introduction

Efficient Living has investigated the estimated thermal comfort, water and energy usage of the proposed development to be built at Shell Cove Precinct C2.

Heating and cooling loads for the development have been determined using BERS Pro Plus 4.4 thermal comfort simulation software. The report is based on the architectural drawings provided by Candalepas Associates For further details refer to the individual BASIX Certificate(s) and Efficient Living's inclusions summary respectively.

This report is based on the plans prepared by Candalepas associates.

Analysis

The BASIX Assessment is divided into three sections; Water, Thermal Comfort and Energy, each independently measuring the efficiency of the development.

BASIX requires a minimum target of 40% for the water section, a pass or fail for the thermal comfort section, and a minimum required target of 30% for the energy section.

Water

The proposed Development has achieved the BASIX Water Target of 40%.

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

The size of the rainwater tank and number of connections may have a significant impact on your water score as does the area of gardens and lawns 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 are measured using BERS Pro Plus V4.4 Thermal Comfort Simulation Software. This calculates the expected level of energy required to heat and cool each dwelling per annum, expressed in megajoules per square metre of floor area (MJ/m^2).

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 30% to pass this section.

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

Inclusions Summary

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

NatHERS Thermal Comfort Inclusions

Glazing Doors/Windows

Group A – awning + casement windows + hinged glazed doors

U-value: 6.70 (equal to or lower than) SHGC: 0.57 (±10%)

Group B – sliding doors/windows + fixed glazing

U-value: 6.70 (equal to or lower than) SHGC: 0.70 (±10%)

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

Note: BASIX Thermal Comfort Protocol Table 3 SHGC value of the unit should be within +/-10% of the value specified for the default window selection on the certificate.

Roof and ceiling

Concrete roof with waterproof membrane, no insulation

Plasterboard ceiling with R2.0 insulation (insulation only value) to soffit of concrete where roof is over

Timber ceiling with R2.0 insulation (insulation only value) to soffit of concrete where roof is over

R4.0 ceiling insulation to unit 404

R4.5 ceiling insulation to unit 405

Plasterboard ceiling, no insulation where neighbouring units are above

External Colour

Light (SA < 0.475)

Ceiling Penetrations

Sealed LED downlights at a maximum of one every 2.5m^2 (one fitting per 5m2 as an upgrade option with a note required on a the plan). Once lighting plan has been developed NatHERS certificate can be updated to improve specification.

External Wall

150mm-250mm concrete with furring channel and plasterboard lining with R2.0 insulation (insulation only value)

External Colour

Default colour modelled

Inter-tenancy walls

75mm Hebel Power Panel to walls adjacent to neighbours and hallways, no insulation required

Minimum 200mm concrete with furring channel and plasterboard lining to all walls adjacent to lift shafts and fire stairs. No insulation 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/unconditioned zones below

Concrete with a minimum R1.5 insulation (insulation only value) to unit G01

Concrete between levels, no insulation required

Floor coverings

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

External Shading

Shading as per stamped documentation

BASIX water inclusions

Score 40/40

Fixtures within units

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

Toilets: 4.0 star

Kitchen taps: 5.0 star

Bathroom vanity taps: 5.0 star

Fixtures within common areas

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

Toilets: 4.0 star

Taps: 5.0 star

Appliances within units

Dishwashers: 4.5 stars

Central rainwater storage

Tank size: 20,000L

Collecting from 1200m^2 roof area (50%)

Connected to outdoor tap for irrigation of common and private landscape

Fire sprinkler test water

Fire sprinkler test water must be contained in a closed loop system

Indigenous and low water use species

300m^2

Common area swimming pools and spas

78kl Pool – no cover

BASIX Energy Inclusions

Score 30/30

Hot water system

Electric Instantaneous R0.75 (~32mm) insulation to ring main and supply risers

Lift motors

All lifts to have gearless traction with VVVF motor

Appliances and other efficiency measures within units

Induction cooktop & electric oven

Dishwashers: 3.5 Star

Clothes dryers: 2.0 Star

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 3.5 – 4.0 is required for cooling; and

A minimum efficiency of EER 3.5 – 4.0 is required for heating

Artificial lighting within units

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

Ventilation within units

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

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

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

Ventilation to common areas

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

Garbage rooms – Supply only, running continuously

Gymnasium - Supply only, BMS controlled

Switch room - Supply only, interlocked to light

Plant/Storage – Supply only, interlocked to light

Dining and lounge – Air conditioning, BMS controlled

Ground floor Lobbies and Hallways – Air conditioning, running continuously

Pool plant room - Supply only, interlocked to light

Plant room - Supply and exhaust air, interlocked to light

Fire control room - Supply and exhaust air, interlocked to light

Booster pump – Exhaust only, interlocked to light

Comms room – Exhaust only, interlocked to light

Ground floor bathrooms - Supply and exhaust air, interlocked to light

Hallways/lobbies (level 1-4) – No mechanical ventilation

Artificial lighting to common areas

Car park area – Light emitting diodes (LEDs) with zoned switching and motion sensors

Lifts – Light emitting diodes (LEDs) connected to lift call button

Garbage rooms – Light emitting diodes (LEDs)with motion sensor

Plant/storage/Switch rooms / Gymnasium– Light emitting diodes (LEDs)with manual on / manual off switch

Ground floor lobby/bathrooms/ Dining and Lounge – Light emitting diodes (LEDs) with motion sensors

Hallways – Light emitting diodes (LEDs) with zoned switching and motion sensors

Alternative Energy

93Kw peak output photovoltaic system

Common area swimming pools and spas

Heating system electric heat pump

Pump controlled by a timer

Thermal Comfort Upgrades

Proposed Residential Development

Shell Cove C2

Issued in accordance with BASIX Thermal Comfort Simulation Method

Certificate # 0006579620 **Accreditation # HERA10033**

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)		
G01	3	126	0	84.6	18.1	5.1	R1.5 underslab insualtion
G02	3	135	5	77.4	14.3	5.5	R1.0 underslab insualtion
G03	3	124	5	73	17.4	5.6	R1.0 underslab insualtion
G04	2	92	0	51	19.1	6.4	R1.0 underslab insualtion
G05	3	122	5	65.5	17.2	5.9	R1.0 underslab insualtion
G06	3	122	5	63.1	12.6	6.2	R1.0 underslab insualtion
G07	2	92	0	47.8	13.6	6.9	R1.0 underslab insualtion
G08	3	124	5	75.2	12.8	5.7	R1.0 underslab insualtion
101	3	125	5	38.8	23.2	6.9	None
102	2	92	0	32.4	19.7	7.4	R1.0 underslab insualtion where unconditoned zone below
103	3	120	5	71.8	13.4	5.8	R1.0 underslab insualtion
104	3	136	5	46.3	17.4	6.8	None
105	3	139	5	46.9	16.9	6.8	None
106	3	126	5	49.1	19.2	6.6	None
107	2	92	0	27.2	21.6	7.6	None
108	3	120	5	50.5	17.3	6.6	None
109	3	122	5	42.4	16.2	7.1	None
110	2	92	0	29	21.7	7.4	None
111	3	125	5	44.1	21	6.7	None
201	3	125	5	42.6	28.4	6.4	None
202	2	93	0	30	22.9	7.4	None
203	3	120	5	51	17.2	6.6	None
204	3	135	5	46.8	17.8	6.8	None
205	3	136	5	54.6	21.6	6.2	None
206	3	126	5	52.2	20.1	6.4	None
207	2	92	0	27.7	21.8	7.5	None
208	3	120	5	51.3	16.8	6.6	None
209	3	122	5	45.1	16.1	6.9	None
210	2	92	0	30.4	21.2	7.4	None
211	3	125	5	48.8	33.1	5.9	None
301	3	125	5	50	25.2	6.3	None
302	2	93	0	41.5	18.1	7	None

Thermal Comfort Upgrades

Proposed Residential Development

Shell Cove C2

Issued in accordance with BASIX Thermal Comfort Simulation Method

Certificate # 0006579620 **Accreditation # HERA10033**

Thermal performance specifications

Unit number	Number of Bedrooms	Floor area (M^2)		Predict. loads (MJ/M²/y)		Star Rating	Thermal Comfort Upgrades
		Con.	Uncon.	Heat	Cool (Sens & Lat)		
303	3	120	5	60.2	15.7	6.2	None
304	3	135	5	56	16.1	6.4	None
305	3	136	5	63.5	18.3	5.9	None
306	3	126	5	59.8	17.1	6.2	None
307	2	93	0	34.9	19.7	7.3	None
308	3	120	5	61.7	15.8	6.2	None
309	3	122	5	52.3	14.2	6.7	None
310	2	92	0	38.3	19.3	7.1	None
311	3	125	5	55.7	27.2	5.9	None
401	3	125	5	72.8	23.2	5.3	R2.0 ceiling insualtion
402	2	93	0	65.5	23.5	5.6	R2.0 ceiling insualtion
403	3	120	5	80.5	15.7	5.3	R2.0 ceiling insualtion
404	3	135	5	70.2	15.9	5.8	R4.0 ceiling insualtion
405	3	138	5	71.7	14	5.8	R4.5 ceiling insualtion
406	3	126	5	82.7	17.1	5.2	R2.0 ceiling insualtion
407	2	92	0	64.1	22.1	5.8	R2.0 ceiling insualtion
408	3	120	5	79.1	14.6	5.4	R2.0 ceiling insualtion
409	3	122	5	68.8	14.9	5.9	R2.0 ceiling insualtion
410	2	92	0	64.3	21.8	5.8	R2.0 ceiling insualtion
411	3	125	5	74.2	18.1	5.4	R2.0 ceiling insualtion

Nationwide House Energy Rating Scheme — Multiple Class1-dwelling summary NatHERS Certificate No. 0006579620

Generated on 17 May 2022 using BERS Pro v4.4.1.5 (3.21)

Property

Address Quayside Avenue , Shell Cove , NSW , 2529

Lot/DP 9009/1254656

NatHERS climate zone 18

Accredited assessor

Tracey Cools

Efficient Living Pty Ltd

admin@efficientliving.com.au

(02)99706181

Accreditation No. HERA10033

Assessor Accrediting Organisation HERA

Verification

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

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (MJ/m^2/p.a.)	Cooling load (MJ/m^2/p.a.)	Total load (MJ/m^2/p.a.)	Star rating
0006576581-03	101	38.8	23.2	62.1	6.9
0006576599-03	102	32.4	19.7	52.2	7.4
0006576607-02	103	71.8	13.4	85.2	5.8
0006576615-02	104	46.3	17.4	63.7	6.8
0006576623-02	105	46.9	16.9	63.8	6.8

Continued Over

National Construction Code (NCC) requirements

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

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

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

Summary of all dwellings (continued)

Certificate number and link	Unit Number	Heating load (MJ/m^2/p.a.)	Cooling load (MJ/m^2/p.a.)	Total load (MJ/m^2/p.a.)	Star rating
0006576631-02	106	49.1	19.2	68.2	6.6
0006576649-02	107	27.2	21.6	48.7	7.6
0006576656-02	108	50.5	17.3	67.8	6.6
0006576664-02	109	42.4	16.2	58.6	7.1
0006576672-02	110	29	21.7	50.8	7.4
0006576680-02	111	44.1	21	65.1	6.7
0006576698-02	201	42.6	28.4	71.1	6.4
0006576706-01	202	30	22.9	52.8	7.4
0006576714-02	203	51	17.2	68.3	6.6
0006576722-02	204	46.8	17.8	64.7	6.8
0006576730-02	205	54.6	21.6	76.2	6.2
0006576748-02	206	52.2	20.1	72.3	6.4
0006576755-01	207	27.7	21.8	49.5	7.5
0006576763-02	208	51.3	16.8	68	6.6
0006576771-02	209	45.1	16.1	61.2	6.9
0006576789-02	210	30.4	21.2	51.5	7.4
0006576797-02	211	48.8	33.1	81.9	5.9
0006576805-02	301	50	25.2	75.2	6.3
0006576813	302	41.5	18.1	59.6	7
0006576821-02	303	60.2	15.7	75.9	6.2
0006576839-02	304	56	16.1	72.2	6.4
0006576847-02	305	63.5	18.3	81.8	5.9
0006576854-02	306	59.8	17.1	76.9	6.2
0006576862-01	307	34.9	19.7	54.6	7.3
0006576870-02	308	61.7	15.8	77.5	6.2
0006576888-02	309	52.3	14.2	66.5	6.7
0006576896-02	310	38.3	19.3	57.5	7.1
0006576904-02	311	55.7	27.2	82.9	5.9
0006576912-03	401	72.8	23.2	96	5.3
0006576920	402	65.5	23.5	89	5.6
0006576938-02	403	80.5	15.7	96.2	5.3
0006576946-01	404	70.2	15.9	86.1	5.8
0006576953-01	405	71.7	14	85.7	5.8
0006576961-02	406	82.7	17.1	99.9	5.2
0006576979	407	64.1	22.1	86.2	5.8
0006576987-02	408	79.1	14.6	93.8	5.4
0006576995-02	409	68.8	14.9	83.7	5.9
0006577001	410	64.3	21.8	86.1	5.8
0006577019-02	411	74.2	18.1	92.3	5.4
0006577027-02	G01	84.6	18.1	102.7	5.1

Certificate number and link	Unit Number	Heating load (MJ/m /p.a.)	Cooling load (MJ/m /p.a.)	Total load (MJ/m /p.a.)	Star rating
0006577035-01	G02	77.4	14.3	91.8	5.5
0006577043-02	G03	73	17.4	90.4	5.6
0006577050-01	G04	51	19.1	70.1	6.4
0006577068-02	G05	65.5	17.2	82.7	5.9
0006577076-02	G06	63.1	12.6	75.7	6.2
0006577084-02	G07	47.8	13.6	61.4	6.9
0006577092-02	G08	75.2	12.8	88	5.7

Explanatory Notes

About this report

This is a summary of NCC Class 1 dwellings in a development. The individual dwellings' ratings are a comprehensive, dynamic computer modelling evaluation of a home, using the floorplans, elevations and specifications to estimate the energy load. It addresses the building layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings), but does not cover the water or energy use of appliances, or energy production of solar panels. For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

To ensure the NatHERS Certificate is of a high quality, always use an accredited or licenced assessor. NatHERS accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO). AAOs have specific quality assurance processes in place, and continuing professional development requirements, to maintain a high and consistent standard of assessments across the country.

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

Disclaimer

The format of the NatHERS Certificate was developed by the NatHERS Administrator. However the content, input and creation of the NatHERS Certificate is by the assessor. It is the responsibility of the assessor who prepared this certificate to use NatHERS accredited software correctly and follow the NatHERS Technical Notes to produce a NatHERS Certificate.

BASIX® Certificate

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

Multi Dwelling

Certificate number: 1219657M_06

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: Tuesday, 17 May 2022
To be valid, this certificate must be lodged within 3 months of the date of issue.

NSW GOVERNMENT | Planning, Industry & Environment

Project summary	
Project name	Shell Cove C2_06
Street address	na Quayside Avenue Shell Cove 2529
Local Government Area	Shellharbour City Council
Plan type and plan number	deposited 1254656
Lot no.	9009
Section no.	-
No. of residential flat buildings	1
No. of units in residential flat buildings	52
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 Pty Ltd
ABN (if applicable): 82116346082

Description of project

Project address	
Project name	Shell Cove C2_06
Street address	na Quayside Avenue Shell Cove 2529
Local Government Area	Shellharbour City Council
Plan type and plan number	deposited 1254656
Lot no.	9009
Section no.	-
Project type	
No. of residential flat buildings	1
No. of units in residential flat buildings	52
No. of multi-dwelling houses	0
No. of single dwelling houses	0
Site details	
Site area (m²)	3344
Roof area (m²)	1900
Non-residential floor area (m²)	0.0
Residential car spaces	117
Non-residential car spaces	0

Common area landscape		
Common area lawn (m²)	0.0	
Common area garden (m²)	809.0	
Area of indigenous or low water use species (m²)	300.0	
Assessor details		
Assessor number	HERA10033	
Certificate number	0006579620	
Climate zone	18	
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	✔ 30	Target 30

Description of project

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

Residential flat buildings - Building1, 52 dwellings, 5 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
101	3	125.0	5.0	0.0	-
106	3	126.0	5.0	0.0	-
111	3	125.0	5.0	0.0	-
205	3	136.0	5.0	0.0	-
210	2	92.0	0.0	0.0	-
304	3	134.0	5.0	0.0	-
309	3	122.0	5.0	0.0	-
403	3	120.0	5.0	0.0	-
408	3	120.0	5.0	0.0	-
G02	3	133.0	5.0	38.0	-
G07	2	92.0	0.0	21.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
102	2	92.0	0.0	0.0	-
107	2	92.0	0.0	0.0	-
201	3	125.0	5.0	0.0	-
206	3	126.0	5.0	0.0	-
211	3	125.0	5.0	0.0	-
305	3	136.0	5.0	0.0	-
310	2	92.0	0.0	0.0	-
404	3	134.0	5.0	0.0	-
409	3	122.0	5.0	0.0	-
G03	3	124.0	5.0	32.0	-
G08	3	124.0	5.0	7.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
103	3	120.0	5.0	0.0	-
108	3	120.0	5.0	0.0	-
202	2	92.0	0.0	0.0	-
207	2	92.0	0.0	0.0	-
301	3	125.0	5.0	0.0	-
306	3	126.0	5.0	0.0	-
311	3	125.0	5.0	0.0	-
405	3	136.0	5.0	0.0	-
410	2	92.0	0.0	0.0	-
G04	2	92.0	0.0	48.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
104	3	134.0	5.0	0.0	-
109	3	122.0	5.0	0.0	-
203	3	120.0	5.0	0.0	-
208	3	120.0	5.0	0.0	-
302	2	92.0	0.0	0.0	-
307	2	92.0	0.0	0.0	-
401	3	125.0	5.0	0.0	-
406	3	126.0	5.0	0.0	-
411	3	125.0	5.0	0.0	-
G05	3	122.0	5.0	34.0	-

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
105	3	136.0	5.0	0.0	-
110	2	92.0	0.0	0.0	-
204	3	134.0	5.0	0.0	-
209	3	122.0	5.0	0.0	-
303	3	120.0	5.0	0.0	-
308	3	120.0	5.0	0.0	-
402	2	92.0	0.0	0.0	-
407	2	92.0	0.0	0.0	-
G01	2	120.0	5.0	42.0	-
G06	3	122.0	5.0	22.0	-

Description of project

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

Common areas of unit building - Building1

Common area	Floor area (m²)
Gymnasium	36.0
Lift car (No.2)	-
Lift car (No.5)	-
Dining and lounge	93.4
Fire control room	46.3
Storage	5.7
Basement Lift lobby	113.2

Common area	Floor area (m²)
Basement car park	4100.0
Lift car (No.3)	-
Main Switch room	26.0
Pool plant	59.7
Booster pump	4.1
Ground floor bathrooms	13.3
Hallway/lobby level 1-4	390.4

Common area	Floor area (m²)
Lift car (No.1)	-
Lift car (No.4)	-
Bin, holding and bulky goods	132.7
Plant	58.0
Comms room	6.1
Ground floor lobby	131.8

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building1
    (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 - Building1

(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	4 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	4.5 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
G07, G08	central water tank (no. 1)	See central systems	See central systems	yes	-	-	-	-
G01, G02, G03, G04, G05, G06	central water tank (no. 1)	See central systems	See central systems	yes	no	no	no	no

(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".		✔	

	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	electric instantaneous	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

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	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
G01	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	yes
102, 107, 110, 202, 207, 210, 302, 307, 310, 402, 407, 410, G04, G07	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	yes
All other dwellings	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	1-phase airconditioning EER 3.5 - 4.0	3 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	yes

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	induction cooktop & electric oven	-	no	3.5 star	-	2 star	-	-

(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)
101	38.8	23.2
102	32.4	19.7
103	71.8	13.4
104	46.3	17.4

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
105	46.9	16.9
106	49.1	19.2
107	27.2	21.6
108	50.5	17.3
109	42.4	16.2
110	29.0	21.7
111	44.1	21.0
201	42.6	28.4
202	30.0	22.9
203	51.0	17.2
204	46.8	17.8
205	54.6	21.6
206	52.2	20.1
207	27.7	21.8
208	51.3	16.8
209	45.1	16.1
210	30.4	21.2
211	48.8	33.1
301	50.0	25.2
302	41.5	18.1
303	60.2	15.7
304	56.0	16.1
305	63.5	18.3
306	59.8	17.1
307	34.9	19.7
308	61.7	15.8
309	52.3	14.2

	Thermal loads	
Dwelling no.	**Area adjusted heating load (in mJ/m²/yr)**	**Area adjusted cooling load (in mJ/m²/yr)**
310	38.3	19.3
311	55.7	27.2
401	72.8	23.2
402	65.5	23.5
403	80.5	15.7
404	70.2	15.9
405	71.7	14.0
406	82.7	17.1
407	64.1	22.1
408	79.1	14.6
409	68.8	14.9
410	64.3	21.8
411	74.2	18.1
G01	84.6	18.1
G02	77.4	14.3
G03	73.0	17.4
G04	51.0	19.1
G05	65.5	17.2
G06	63.1	12.6
G07	47.8	13.6
All other dwellings	75.2	12.8

(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	4 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central water tank - rainwater or stormwater (No. 1)	20000.0	To collect run-off from at least: - 1200.0 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 809.0 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site
Pool (No. 1)	Volume: 78.0 kLs	Location: Building1 Pool shaded: no	-

Central systems	Size	Configuration	Connection (to allow for...)
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-
Fire sprinkler system (No. 5)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-

(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 ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Gymnasium	ventilation supply only	time clock or BMS controlled	light-emitting diode	manual on / manual off	No
Basement car park	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	time clock and motion sensors	No
Lift car (No.1)	-	-	light-emitting diode	connected to lift call button	No
Lift car (No.2)	-	-	light-emitting diode	connected to lift call button	No
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
Lift car (No.5)	-	-	light-emitting diode	connected to lift call button	No
Main Switch room	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	No
Bin, holding and bulky goods	ventilation supply only	-	light-emitting diode	motion sensors	No

	Common area ventilation system		Common area lighting		
Common area	**Ventilation system type**	**Ventilation efficiency measure**	**Primary type of artificial lighting**	**Lighting efficiency measure**	**Lighting control system/BMS**
Dining and lounge	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	No
Pool plant	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	No
Plant	ventilation (supply + exhaust)	interlocked to light	light-emitting diode	manual on / manual off	No
Fire control room	ventilation (supply + exhaust)	interlocked to light	light-emitting diode	manual on / manual off	No
Booster pump	ventilation exhaust only	interlocked to light	light-emitting diode	manual on / manual off	No
Comms room	ventilation exhaust only	interlocked to light	light-emitting diode	manual on / manual off	No
Storage	ventilation supply only	interlocked to light	light-emitting diode	manual on / manual off	No
Ground floor bathrooms	ventilation (supply + exhaust)	interlocked to light	light-emitting diode	motion sensors	No
Ground floor lobby	air conditioning system	none ie. continuous	light-emitting diode	motion sensors	No
Basement Lift lobby	air conditioning system	none ie. continuous	light-emitting diode	motion sensors	No
Hallway/lobby level 1-4	no mechanical ventilation	-	light-emitting diode	motion sensors	No

Central energy systems	Type	Specification
Central hot water system (No. 1)	electric instantaneous	Piping insulation (ringmain & supply risers): (a) Piping external to building: R0.75 (~32 mm); (b) Piping internal to building: R0.75 (~32 mm)
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 7
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 7
Lift (No. 3)	gearless traction with V V V F motor	Number of levels (including basement): 7
Lift (No. 4)	gearless traction with V V V F motor	Number of levels (including basement): 7
Lift (No. 5)	gearless traction with V V V F motor	Number of levels (including basement): 2

Central energy systems	Type	Specification
Pool (No. 1)	Heating source: electric heat pump	Pump controlled by timer: yes

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	4 star (> 6 but <= 7.5 L/min)	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.	✔	✔	✔

Central energy systems	Type	Specification
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 93.0 peak kW

Notes

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

Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).