

ESD, BASIX and NatHERS

Summary Report

**146 Arthur Street,
North Sydney, 2060**

**Prepared for
AQUALAND**

**Prepared by
INTEGRECO CONSULTING**

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3 (18/04/24)	MP and checked JP	DA SET – 22.03.2024 Woods Bagot Architects
4 (01/05/24)	MP and checked JP	DA SET – 22.03.2024 Woods Bagot Architects

I, Martin Pinson (INTEGRECO CONSULTING), confirm this “ESD and BASIX Report” addresses the requirement of SEAR No. SSD-61000021 and relevant State and local legislation, policies, and guidelines (including SEAR 9, Sustainable Building SEPP, NCC 2022, BASIX v4 2024, NatHERS Protocol and North Sydney Development Control Plan). I further confirm that none of the information contained in this “ESD and BASIX Report” is false or misleading.

Table of Contents

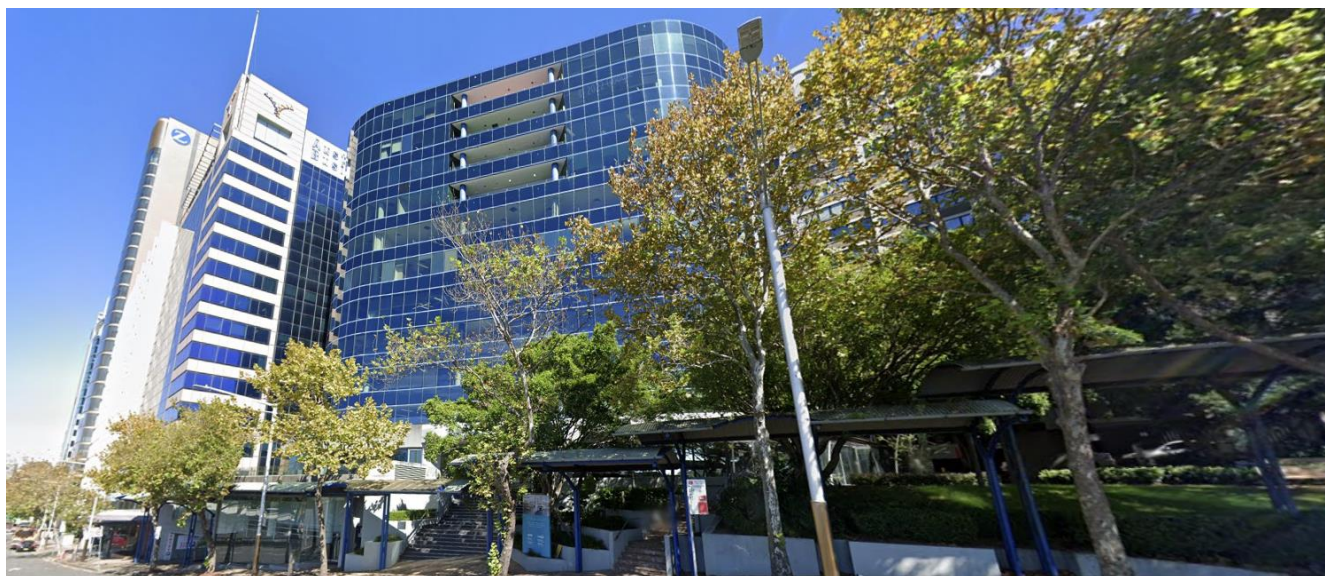
1. Introduction and ESD Summary.....	4
1.1 ESD Summary.....	9
1.2 Thermal Comfort Summary	11
1.3 BASIX Summary.....	13
1.4 EER – Energy Efficiency Report	21
2. ESD Strategy (Environmentally Sustainable Development)	22
2.1 Governance.....	22
2.1.1 Commissioning and Tuning	22
2.1.2 Adaptation and Resilience.....	22
2.1.3 Building Information.....	23
2.1.4 Metering and Monitoring.....	23
2.1.5 Construction Environmental Management.....	23
2.1.6 Operational Waste	23

2.2 Indoor Environmental Quality	24
2.2.1 Indoor Air Quality	24
2.2.2 Acoustic Comfort	24
2.2.3 Visual Comfort	24
2.2.4 Daylighting	24
2.2.5 Thermal Comfort	25
2.3 Energy	26
2.3.1 National Construction Code Section J for Energy Efficiency	26
2.3.2 Energy reduction strategies	27
2.4 Transport	28
2.4.1 Active Transport Facilities	28
2.4.2 Walkable Neighbourhood & Public Transport	29
2.4.2 Electric car recharging stations	30
2.5 Water	31
2.5.1 Water strategies	31
2.6 Materials	32
2.6.1 Material Selection	32
2.6.2 Waste minimisation	33
2.7 Land Use & Ecology	34
2.8 Emissions	34
2.8.1 Reduced Peak Discharge to Stormwater	34
2.8.2 Light Pollution	34
2.8.3 Heat Island Effect	35
2.8.4 Refrigerant impacts	35
2.8.5 Solar Reflectivity	35
2.9 Community	36
3. Conclusion	37
4. Appendix 1 – BASIX and ESD Certificates	38

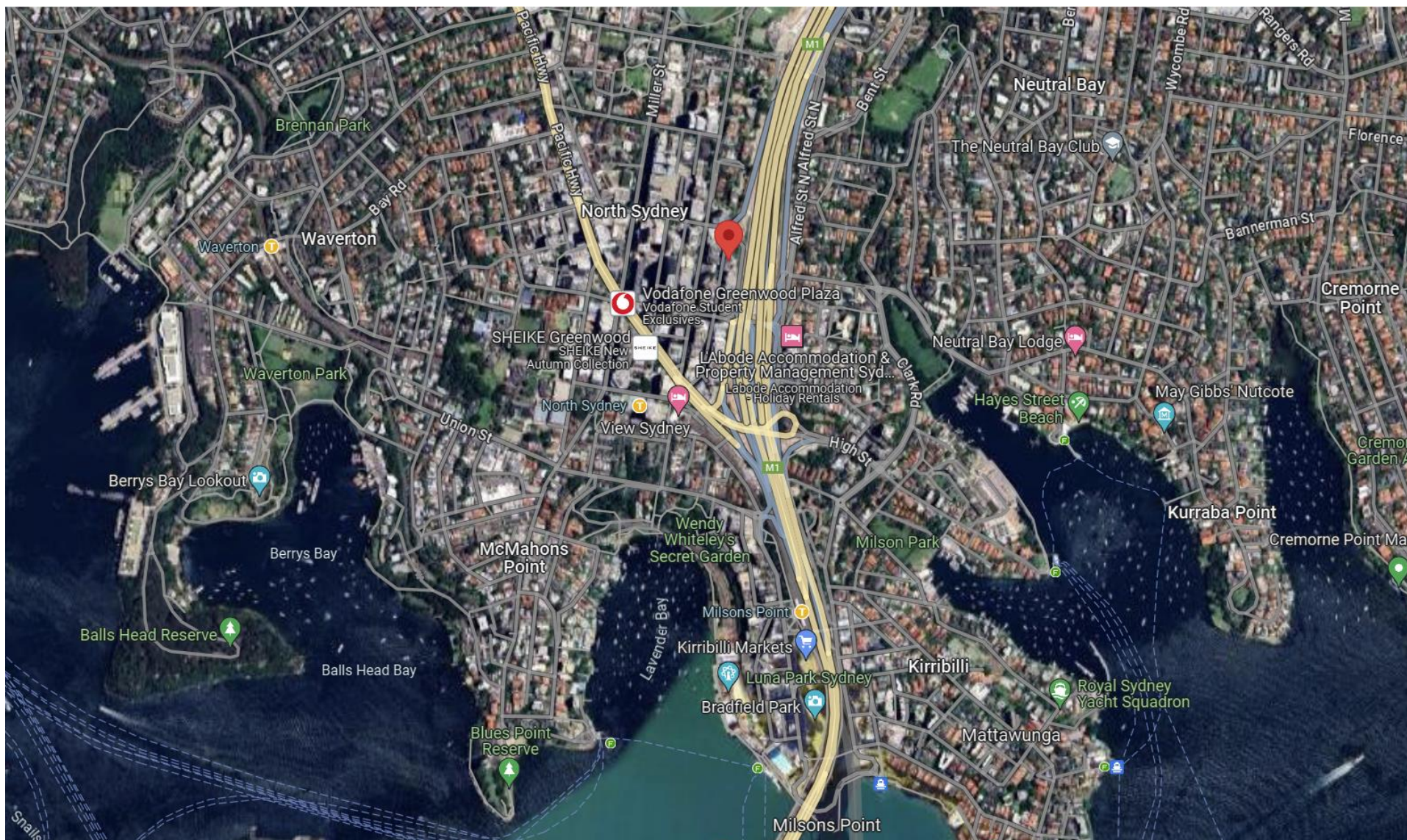
1. Introduction and ESD Summary

This report summarises the BASIX and thermal comfort aspects for the proposed development, at 146 Arthur Street, North Sydney, NSW 2060. The client and the design team have made a strong commitment to ESD, especially for items such as thermal comfort, water, energy, waste, materials, transportation, management and landscaping. This report discusses, in detail, how the proposal has embraced these sustainability principles. The design used SEAR 9 (see below) as well as the Sustainable Building SEPP, North Sydney Development Control Plan (DCP) 2013 and NCC 2022.

SEAR 9. Ecologically Sustainable Development (ESD)	
Identify how ESD principles (as defined in section 193 of the EP&A Regulation) are incorporated in the design and ongoing operation of the development.	Principles of ecologically sustainable development are discussed in pages 9-37 (ESD specs and discussion)
Demonstrate how the development will meet or exceed the relevant industry recognised building sustainability and environmental performance standards.	See report and Appendix 1 for compliant certificates
Demonstrate how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050) and consumption of energy, water (including water sensitive urban design) and material resources.	See report pages 9-21 for specifications. See report pages 22-37 for ESD discussions



Site Context Photo - 146 Arthur Street, North Sydney, NSW 2060



Site Location Plan - 146 Arthur Street, North Sydney, NSW 2060



Proposed Site Plan (by Woods Bagot) - 146 Arthur Street, North Sydney, NSW 2060



The Integreco team have worked very closely with the design team, to ensure a high level of energy-efficiency and environmental sustainability. Importantly, a strong emphasis was placed on the passive efficiency of the building (including passive heating, passive cooling, natural lighting and natural ventilation). The architects have done an excellent job to ensure that these passive systems are working effectively, through a very careful and intelligent blend of innovative architectural design and passive thermal comfort techniques.

For example, the use of building articulation and orientation was used to enhance natural lighting, passive heating and cross ventilation. These techniques are far too often neglected in buildings of this scale, especially in buildings with predominantly single-aspect dwellings. The excellent thermal comfort results are a testament to the success of this excellent architectural design, on a tricky site. Intelligent and high-tech facades have greatly helped this achievement, including shading devices and high-performance specifications for all windows and glazed doors (including double glazing and performance frames, for all units and most non-residential).



3D Render (by Woods Bagot) - 146 Arthur Street, North Sydney, NSW 2060

1.1 ESD Summary

Some of the main ESD categories (for residential and non-residential) will be targeted as follows:

1. ESD - An ecologically sustainable design (ESD) consultant was part of the design team. Integreco have suggested and tested various suitable and effective ESD initiatives. Integreco has many decades of experience and includes engineers, architects and energy experts.
2. Climate Resilience – Approaches have included: designing for extreme rainfall events; inclusion of low-level and rooftop shade structures; use of cross ventilation for night-time flushing; cross-ventilation for fresh air and respite from extreme heat; materials selection (including generous thermal mass) which is supportive of passive cooling; drought-tolerant landscaping; and careful building design to cope with extended heatwave conditions. Passive cooling processes were also used cleverly, throughout the buildings, such as thermal mass, shading devices, dual-aspect designs, overhangs, eaves, winter gardens, water features and large window openings.
3. Passive Design - The buildings express a strong commitment to passive design (such as optimal orientation, shading devices, cross ventilation, thermal, mass, winter gardens and open plan living). Performance glazing is also proposed for all the development, including double glazing, appropriate tinting and high-performance frames. Importantly, the intelligent use of facades, rather than just ceiling fans should give an optimum summer performance, for the base building. That said, the ceiling fans, where proposed, are adding extra stars to the NatHERS scores and these are rewarded (correctly) as ‘passive systems’, since they are so energy-efficient.
4. Energy efficiency - To minimise energy use, the residential buildings have many low-energy initiatives, as discussed in the Energy and BASIX sections of this report. These include items such as PV solar power; generous insulation; performance glazing; shading devices; low-energy HVAC; efficient appliances; efficient lighting; timers/sensors; electric heat-pump hot water; and metering systems.
5. Waste reduction - Waste management plans will be prepared for the construction and the operational phases. These plans will demonstrate the application of principles of the waste management hierarchy of waste: avoid use, reduction, re-use and recycling. In particular high levels of recycling of construction and demolition waste will be targeted (over 90% waste). The project will also target 70% operational waste to be diverted from landfill including compostable organics and green waste.
6. Water efficiency - Rainwater for irrigation and pool top-ups is proposed. Water fixtures and fittings are also highly rated, including close-to-best ratings for taps, showers and toilets. Furthermore, at least 50% of planting uses locally indigenous or low-water species.
7. Eco Transport – Good access to public transport, car-sharing, electric car chargers and bicycle storage has been proposed. Electric car-charging has been included, with flexibility for current and future scenarios. Travel information kits for residents and workers will also be generated later. This will encourage public transport, walking, bicycles and carshare schemes (over private motor vehicle use).

Some of the other ESD initiatives are listed below. These are also listed later in the report, in regard to water, energy, ESD and BASIX:

- Energy-efficient whitegoods (high-rated dryers, dishwashers, etc)
- Water-efficient fixtures (very high ratings for toilets, showers and taps) and reduced flow to sewer
- Rainwater reuse for irrigation and car wash (20 kL minimum rainwater storage)
- Recycling or reusing (closed loops) of water from fire pump testing.
- Efficient irrigation such as drip irrigation, timers and moisture -sensors for planters and gardens.
- At least 50% use by area of locally indigenous or “one-drop” water-efficient plants
- Generous deep-soil allocation and planter bed gardens.
- Recycling of construction and demolition waste (over 90% of total waste by mass).
- The use of re-usable formwork for internal floors and core walls on site.
- Paints and floor-coverings with low VOCs, wherever possible.
- Wood products with low formaldehyde (and VOCs), wherever possible.
- Water-based and low-emission paints where possible, for internal 'low-sheen' areas.
- Low-emission and (where practical) water-based paints for internal gloss or semi-gloss finishes.
- Intent to research and include, where possible, some products/materials certified by GreenTag/GECA.
- Specification of sustainable-timber, where possible, using FSC or PEFC (for structure, trims, etc).
- PV solar power to provide power for common lighting or other uses
- Motion-sensors and time-based controllers (time clocks) for lights, ventilation, etc.
- Air quality (CO/CO2) monitors for the car park ventilation system control and efficient VSD fans.
- Light-colour roofs, generous vegetation and passive cooling to reduce “urban heat-island effects”.
- Sensible access to and bus transport as well as an extensive network of bike paths.
- Generous Bicycle Parking and proposed ‘Travel Kits’ to educate residents
- Use of “Carshare” schemes, electric-car charging and other efficient-vehicle-alternatives
- Reduced topsoil removal, ecosystem renewal and mostly low-water or locally indigenous plants
- Reduced Operating Costs (water, gas, electricity) due to the good ESD, BASIX and NatHERS scores

1.2 Thermal Comfort Summary

The development has achieved the following NatHERS scores:

- Average NatHERS rating > 8.4 stars
- Average cooling load <10 MJ/m2.year (permitted average is 29.0 MJ/m2.year) – approx. 65% better than target
- Average heating load <8 MJ/m2.year (permitted average is 18.6 MJ/m2.year) – approx. 55% better than target

To achieve these scores, the following materials and construction systems have been proposed:

NatHERS - Thermal Comfort for Units	Proposed Specifications
External Walls 1	Concrete wall + R2.5 and foil added + thermal break R0.2
External Walls 2	Colorback glass +R2.5 and foil added + thermal break R0.2
External Walls 3	Other cladding +R2.5 and foil added + thermal break R0.2
Unit Walls next to halls/lobbies 1	Hebel 75mm wall + R2.0 added + thermal break R0.2
Unit Walls next to halls/lobbies 2	Concrete columns + R2.0 added + thermal break R0.2
Party walls 1	Plasterboard + 75mm Hebel + optional insulation
Party walls 2	Conc. columns + plasterboard + optional insulation
Walls next to lifts	Concrete ≥150mm and plasterboard + optional insulation
Walls next to stairs	Concrete ≥150mm and plasterboard + optional insulation
Internal Walls	Plasterboard (some concrete columns)
Internal Floors	Concrete floors, with plasterboard below
External Floors	Concrete slab with open air (or other conditioned) below
External Floor Insulation over Basement	Not applicable for apartments
External Floor Insulation over open air / open lobby	R2.5 added + thermal break R0.2
Floor Finishes in units	Tiles - wet areas, carpet – bedrooms, timber - living/dining
Roofs – penthouses	Concrete roof + R2.4 & foil + plasterboard + thermal break R0.2 (R3.5/foil for 4401)
Roofs – non-penthouses (under terraces, etc)	Concrete roof + R2.4 & foil + plasterboard + thermal break R0.2
Roof Colour	Light colour roofs

NatHERS - Thermal Comfort Items	Proposed Specifications
Skylights	None proposed for apartments
Window Shading	Eaves and overhangs + Screens as shown with fixed blades
Weather Stripping	All external doors and windows
Ceiling Penetrations Lights	LED downlights - generic holes assumed, as per NatHERS protocol (TBC at CC)
Ceiling Penetrations Fans	Bathroom, laundry, kitchen: generic holes from NatHERS protocol (TBC at CC)
Operable panel (in 11 east columns) for ventilation	Operable panels will be width of columns and height of adjacent window R value will be R1.5 or more and modelled as U=0.8 window with 100% shade
Ceilings fans (generic 1400 fans)	Fans in all bedrooms Fans in some living (all single aspect and NOT end units 201-4401,202-4402,205-4405,206-4406)

1. WINDOWS – see below for all residential	WINDOWS for all residential
1. Window (AWNING or HINGED)	Aluminium frames and performance double-glazed
Windows - U-value	≤ 2.5
Windows – SHGC	$0.25 \pm 5\%$
2. Windows (SLIDERS/ HUNG)	Aluminium frames and performance double-glazed
Windows - U-value	≤ 2.0
Windows – SHGC	$0.23 \pm 5\%$
3. Windows (FIXED GLAZING)	Aluminium frames and performance double-glazed
Windows - U-value	≤ 2.0
Windows – SHGC	$0.23 \pm 5\%$

Simulation Notes:

- Neighbouring buildings on site are modelled as shown (for overshadowing) but no tree preservations are in place and no trees are modelled.
- Shading devices used from elevations, sections and plan mark-ups (this needs re-checking at CC stage).
- No RCP provided at DA so generic holes assumed for all downlights (must have extra checking and rerunning at CC stage)
- No RCP provided at DA so generic holes assumed for exhaust fans (must have extra checking and rerunning at CC stage)
- Concrete walls and floor thickness need checking at CC stage, due to complexity of the proposed construction.
- All wall types, ceiling types, floor types need checking at CC stage, due to complexity of the proposed construction.
- Window sizes used from elevations, sections and plan mark-ups (may need re-checking at CC stage).
- Door sizes used from elevations, sections and plan mark-ups (this needs re-checking at CC stage).
- Operable panels assumed at width of columns on east (11 columns) and will be height of adjacent window (this needs re-checking at CC stage).

1.3 BASIX Summary

The following specifications are proposed for BASIX water and energy items:

BASIX Item - Water	Proposed Specifications
Rainwater Tank	20 kL tanks(s) to collect from 400 m2 roof (no planters)
Rainwater Tank use	Irrigation for planting and lawn (on ground and on-slab) and 1 car wash
Reticulated Treated Water use	Not available
Stormwater Tank	None (but non-trafficable roofs will drain to rainwater tank)
Blackwater/Greywater reuse	No treatment on site
Fire Sprinklers	Sprinklers in both basement + buildings
Fire Sprinkler Test Water	Fire test water reused in closed loops (for basement and building)
Showers	4 stars ≤ 6.0 L/min (low-flow in BASIX)
Toilets	4 stars
Kitchen Taps	5 stars
Bathroom Taps	5 stars
On demand hot recirculation	Not proposed
Clothes washers	Not supplied
Dishwashers	5 stars WELS or better
Planting areas (and lawn)	Maximum 700 m2 planting + 0 m2 lawn (estimate 432m2 plants)
Planting – low water species	>50% of planting area is locally indigenous
Pools and spas	Pools/spa use heat pump heat + pump timer + no covers, except spa covers
Pool and spa sizes (common area)	Pools <95 kL and spa <14 kL
Private water meter – central cooling	Private water meter proposed on the make up line and connected to BMS
Conductivity controller	Conductivity controller is proposed

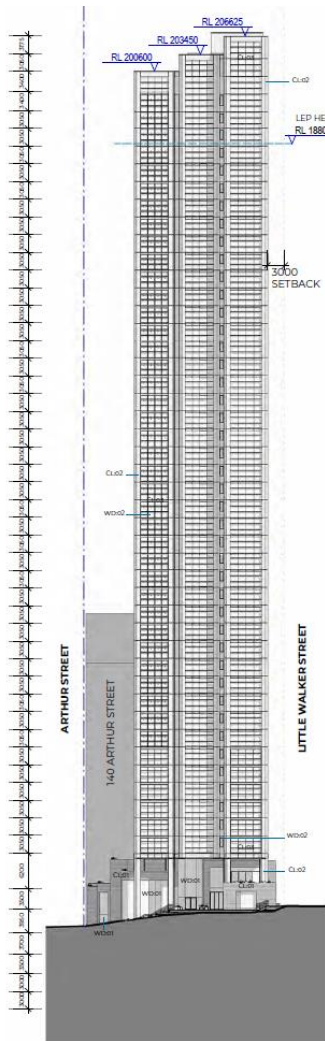
BASIX Item - Energy	Proposed Specifications
Hot Water	Electric Heat Pump (Elec, air-sourced, 2.5 to 3 COP) +R1 to ringmains/risers
Heating for Units -Beds	Central - Water-sourced packed unit (heat pump + medium COP 3.5 to 4.5)
Heating for Units -Living	Central - Water-sourced packed unit (heat pump + medium COP 3.5 to 4.5)
Cooling for Units -Beds	Central - Water-sourced packed unit (cooling tower and medium COP 3.5 to 4.5)
Cooling for Units -Living	Central - Water-sourced packed unit (cooling tower and medium COP 3.5 to 4.5)
AC zoning (day/night zoning)	Not used - hence AC can cool both beds and living (at same time)
Laundry Exhaust	Fan to façade/roof, manual on and manual off
Bathroom Exhaust	Fan to façade/roof, manual on and manual off
Kitchen Exhaust	Fan to façade/roof, manual on and manual off
Lighting for Apartments – all rooms	LEDs ≥80% fittings all rooms (dedicated)
Cooking	Induction cooktop & electric oven
Vented fridge-spaces	Not assessed
Dishwashers	4 stars energy or more
Dryers	8 stars energy or more
Clothes washers	Not supplied
Indoor clothesline	Not used (since this needs 12m retractable lines for balcony / bathroom)
BMS	Yes, included (including BMS common lights)
PFC - Power Factor Correction	Yes, included
PV Solar Power	78 kW peak output or more
Lifts	VVVF gearless traction with regeneration drives
Pools and spas	Pools/spa use heat pump heat + pump timer + no covers, except spa covers
Pool and spa sizes (common area)	Pools <95 kL and spa <14 kL
Sauna	Infrared heating source – manual on and timer off

Common area name	Area (m ²)	Primary lighting system type 	Efficiency measure 	Lighting control system / BMS 
Lift bank (No. 1)	n/a	light-emitting diode 	connected to lift call button 	☒ Yes ☐ No
Lift bank (No. 2)	n/a	light-emitting diode 	connected to lift call button 	☒ Yes ☐ No
Indoor swimming pool and spa area	156	light-emitting diode 	daylight sensors 	☒ Yes ☐ No
Gym area	47	light-emitting diode 	daylight sensors 	☒ Yes ☐ No
Undercover car park area	2035	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Switch rooms	23	light-emitting diode 	motion sensors 	☒ Yes ☐ No
Garbage rooms lower	54	light-emitting diode 	motion sensors 	☒ Yes ☐ No
Garbage rooms upper	103	light-emitting diode 	motion sensors 	☒ Yes ☐ No
Community 1 - kids play	24	light-emitting diode 	motion sensors 	☒ Yes ☐ No
Community 2 - cinema	21	light-emitting diode 	manual on / manual off 	☒ Yes ☐ No
Community 3 - games room	9	light-emitting diode 	motion sensors 	☒ Yes ☐ No
Community 4 - lounge circulation	49	light-emitting diode 	motion sensors 	☒ Yes ☐ No
Community 5 - residential lounge	70	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Community 6 - main lounge	95	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Community 7 - flex/community lower	133	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Community 8 - co-work lower	35	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Community 9 - co work sky bridge	33	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Community 10 - community rooms top	80	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Community 11 - bookable rooms top	102	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No
Plant or service rooms	149	light-emitting diode 	zoned switching with motion 	☒ Yes ☐ No

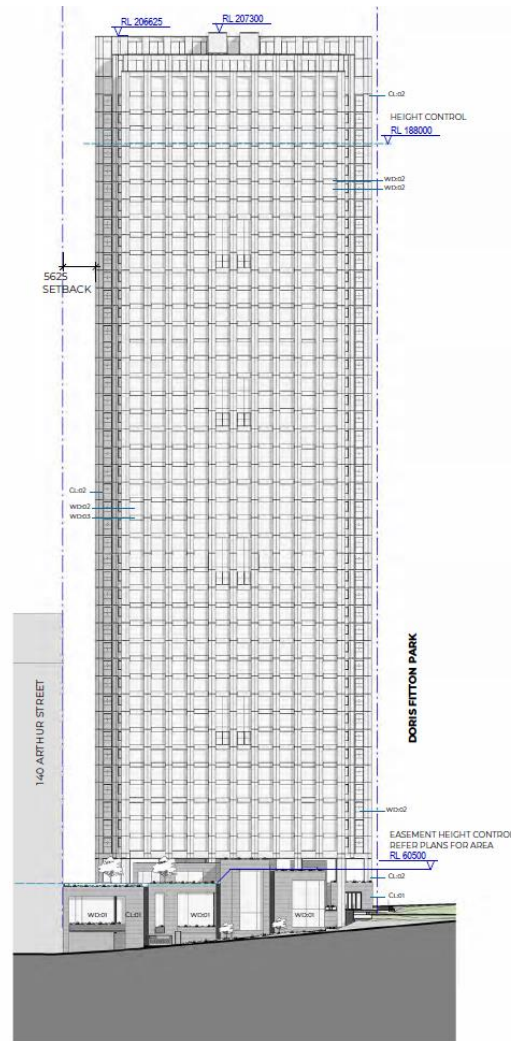
Common area name	Area (m ²)	Primary lighting system type [*] ⓘ	Efficiency measure [*]	Lighting control system / BMS ⓘ
Plant fan rooms	25	light-emitting diode ▾	motion sensors ▾	☒ Yes ☐ No
Plant substation	56	light-emitting diode ▾	motion sensors ▾	☒ Yes ☐ No
Plant circulation areas	82	light-emitting diode ▾	motion sensors ▾	☒ Yes ☐ No
Plant upper levels	24	light-emitting diode ▾	motion sensors ▾	☒ Yes ☐ No
Office in main lobby	3	light-emitting diode ▾	manual on / manual off ▾	☒ Yes ☐ No
Bike storage	128	light-emitting diode ▾	zoned switching with motion ▾	☒ Yes ☐ No
Toilets residential	33	light-emitting diode ▾	zoned switching with motion ▾	☒ Yes ☐ No
Storage and bulky store	116	light-emitting diode ▾	zoned switching with motion ▾	☒ Yes ☐ No
Ground floor lobbies	113	light-emitting diode ▾	zoned switching with motion ▾	☒ Yes ☐ No
Hallway/lobby upper levels	1364	light-emitting diode ▾	zoned switching with motion ▾	☒ Yes ☐ No

Common area name	Floor area (m ²)	Select the ventilation system type *	Select the efficiency measure *
Indoor swimming pool and spa area	156	tempered supply air only ▾	time clock or BMS controlled ▾
Gym area	47	air conditioning system ▾	time clock or BMS controlled ▾
Undercover car park area	2035	ventilation (supply + exhaust) ▾	carbon monoxide monitor + VSD fan ▾
Switch rooms	23	ventilation exhaust only ▾	thermostatically controlled ▾
Garbage rooms lower	54	ventilation exhaust only ▾	n/a
Garbage rooms upper	103	ventilation exhaust only ▾	n/a
Community 1 -kids play	24	air conditioning system ▾	time clock or BMS controlled ▾
Community 2 -cinema	21	air conditioning system ▾	time clock or BMS controlled ▾
Community 3 -games room	9	air conditioning system ▾	time clock or BMS controlled ▾
Community 4 -lounge circulation	49	air conditioning system ▾	time clock or BMS controlled ▾
Community 5 -residential lounge	70	air conditioning system ▾	time clock or BMS controlled ▾
Community 6 -main lounge	95	air conditioning system ▾	time clock or BMS controlled ▾
Community 7 -flex/community lower	133	air conditioning system ▾	time clock or BMS controlled ▾
Community 8 -co-work lower	35	air conditioning system ▾	time clock or BMS controlled ▾
Community 9 -co work sky bridge	33	air conditioning system ▾	time clock or BMS controlled ▾
Community 10 -community rooms top	80	air conditioning system ▾	time clock or BMS controlled ▾
Community 11 -bookable rooms top	102	air conditioning system ▾	time clock or BMS controlled ▾
Plant or service rooms	149	ventilation exhaust only ▾	time clock or BMS controlled ▾
Plant fan rooms	25	no mechanical ventilation ▾	n/a
Plant substation	56	ventilation exhaust only ▾	time clock or BMS controlled ▾

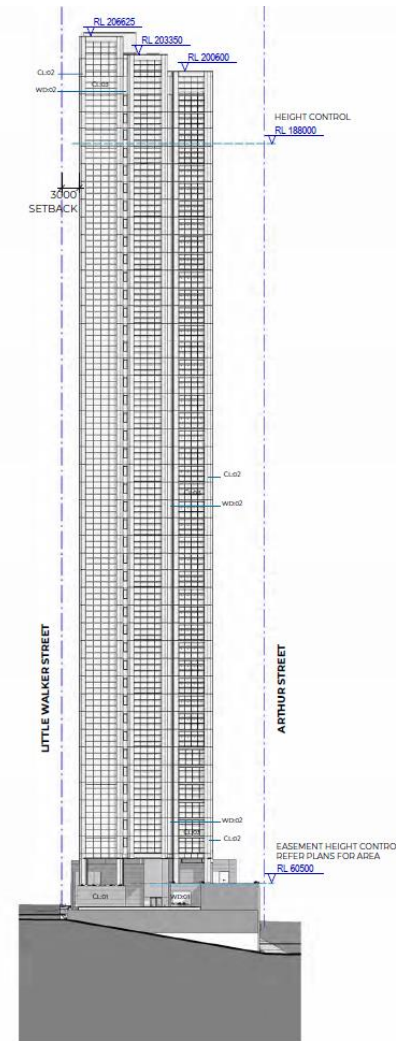
Common area name	Floor area (m ²)	Select the ventilation system type *	Select the efficiency measure *
Plant circulation areas	82	ventilation supply only ▼	none i.e., continuous ▼
Plant upper levels	24	ventilation supply only ▼	time clock or BMS controlled ▼
Office in main lobby	3	air conditioning system ▼	time clock or BMS controlled ▼
Bike storage	128	ventilation supply only ▼	time clock or BMS controlled ▼
Toilets residential	33	ventilation exhaust only ▼	time clock or BMS controlled ▼
Storage and bulky store	116	ventilation supply only ▼	time clock or BMS controlled ▼
Ground floor lobbies	113	air conditioning system ▼	time clock or BMS controlled ▼
Hallway/lobby upper levels	1364	tempered supply air only ▼	time clock or BMS controlled ▼



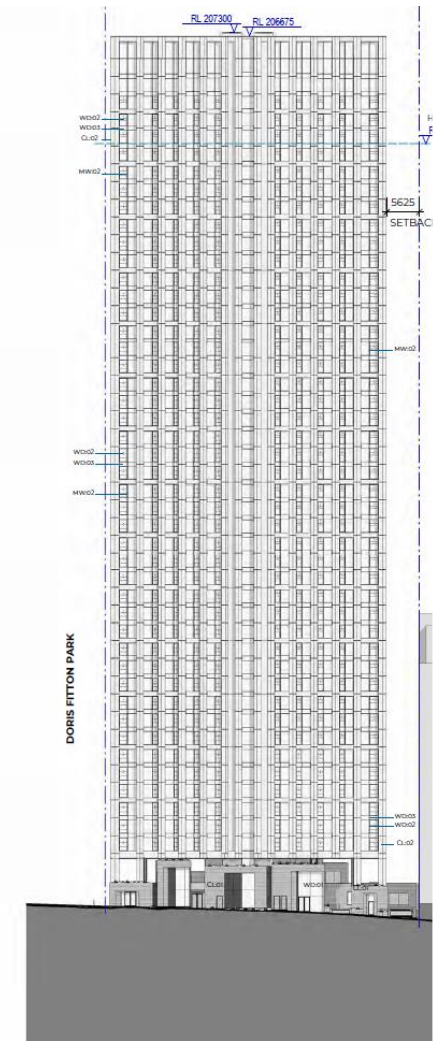
1 Overall Elevation - North
SCALE 1:500



2 Overall Elevation - East
SCALE 1:500

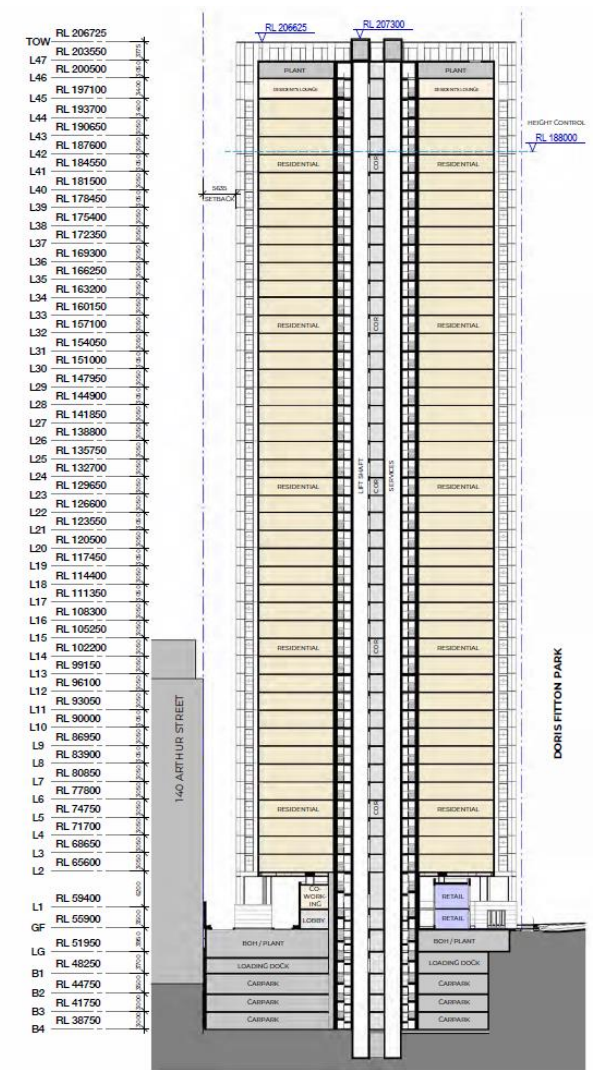
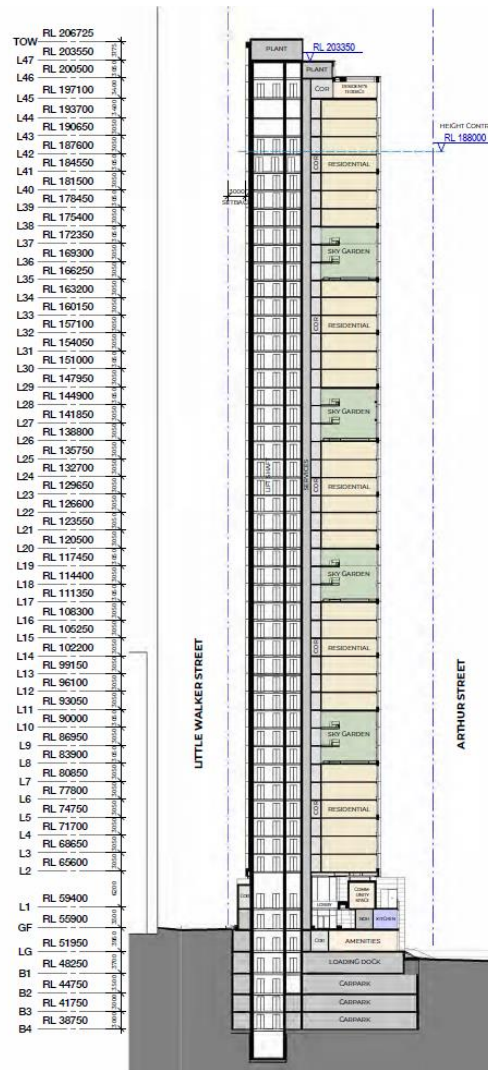
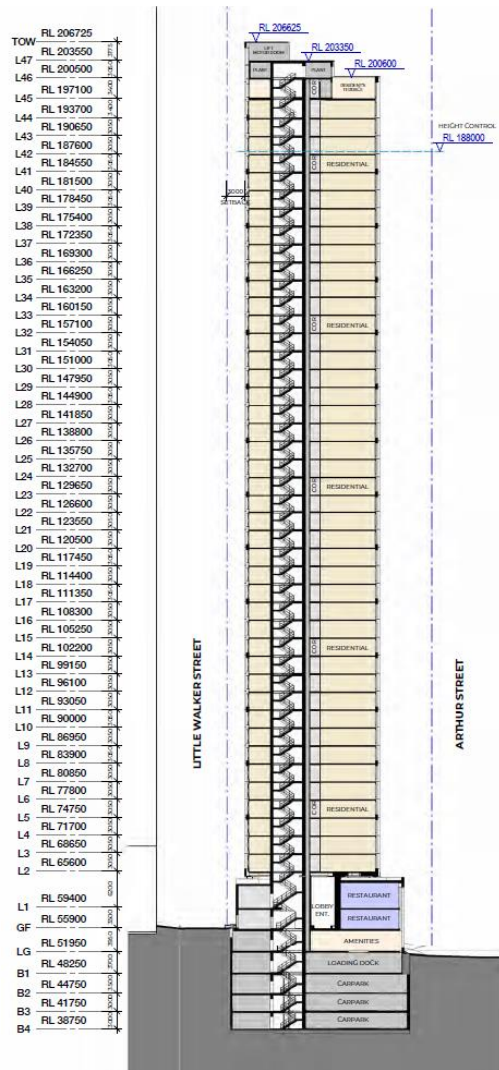


4 Overall Elevation - South
SCALE 1:500



3 Overall Elevation - West
SCALE 1:500

ELEVATIONS - 146 Arthur Street, North Sydney, NSW 2060



SECTIONS (by Woods Bagot) - 146 Arthur Street, North Sydney, NSW 2060

1.4 EER – Energy Efficiency Report

The mechanisms for energy assessment will be Section J and JV3 (for Retail / Commercial portions) and BASIX (for residential and common areas). The energy strategies below were implemented. Some of these items were listed previously in this BASIX report.

Greenhouse-gas reduction and energy-efficiency initiatives include:

- Development has well-surpassed the BASIX Energy Target of 63 (target for 5+ stories).
- Project scoring an average >8.4-star NatHERS rating across the development. This is above the minimum required to pass BASIX and this contributed towards the excellent energy performance.
- Average cooling load <10 MJ/m².year (permitted average is 29.0 MJ/m².year) – approx. 65% better than target
- Average heating load <8 MJ/m².year (permitted average is 18.6 MJ/m².year) – approx. 55% better than target
- PV solar power to provide power for common lighting or other uses
- Lighting throughout the development will use LED technology (or high efficiency CFL's where appropriate).
- Fixtures, fittings and HVAC are very low-energy and include highly rated whitegoods and energy-efficient AC for units
- A building engineer/manager will be used to undertake building commissioning, for required systems, upon completion.
- Unit design included effective cross-ventilation, generous insulation, operable glazing and suitable shading devices. In particular, the corner dwellings, the dual aspect dwellings, the thermal mass and the large openings (such as sliders) all helped the passive cooling and heating.
- Glazing was appropriately designed to reduce heat losses in winter, and to give opportunities for natural cooling in summer. Furthermore, performance glazing is proposed for all of the development, including double-glazing for all apartments, retail and commercial areas.
- External walls, floors and roofs will all contain very generous added insulation, to help reduce the reliance on mechanical heating & cooling.
- Good Section J results were achieved, due to generous insulation, shading, thermal mass and high-end double-glazing throughout.

2. ESD Strategy (Environmentally Sustainable Development)

This project will be designed and built in accordance with many best practice principles of "Ecologically Sustainable Development" (ESD). This following ESD discussion describes some of the initiatives relating to governance, indoor environmental quality, energy, water, transport, emissions, ecology, materials and community.

2.1 Governance

The proposed development will establish and maintain strong governance practices. These, in turn, will promote engagement, transparency and resilience to the conditions of a changing climate.

Good environmental management practices will be adopted, including enhanced commissioning, ongoing tuning and the production of building-user information. Best practice construction environmental management processes will also be implemented. Furthermore, waste diversion from landfill will be targeted, through intensive recycling of construction and operational waste, wherever possible. Metering and monitoring strategies will also ensure operational performance can be tracked and optimised, for water, energy and HVAC.

2.1.1 Commissioning and Tuning

Relevant subcontractors will undertake detailed commissioning and building tuning for all major systems in the building. These systems will relate to water, energy and HVAC.

2.1.2 Adaptation and Resilience

Climate change adaptation and resilience has been considered in detail. This "futureproofing" strategy will enable the building to adapt to potential climate change challenges and future extreme weather events (with the intention of minimising both risk and disruption to the occupants, the building and the community). In particular, the use of rainwater tanks will help reduce the impact of drought periods, for irrigation. The use of performance glass, generous insulation and other thermal comfort techniques will help to deal with changes in climatic conditions, without the excessive reliance on AC. Light colours, shading and generous planting will also reduce heat-island effects.



2.1.3 Building Information

Building operation and maintenance information will be provided and this information may be used to educate building occupants and visitors on the sustainability features of the buildings and how to use these features effectively, in order to reduce potential environmental impacts.

2.1.4 Metering and Monitoring

A metering and monitoring strategy will be implemented to track energy and water use. This system will also monitor progress against performance targets and assist with the identification of leaks, faults or excessive consumption. Sub-metering will be provided for major energy and water uses, supplying data to a Data Collection Point and/or a Building Management System (BMS). Energy sub-metering will be provided for end users. Likewise, water sub-metering may be provided for a variety of uses, pending the final design.

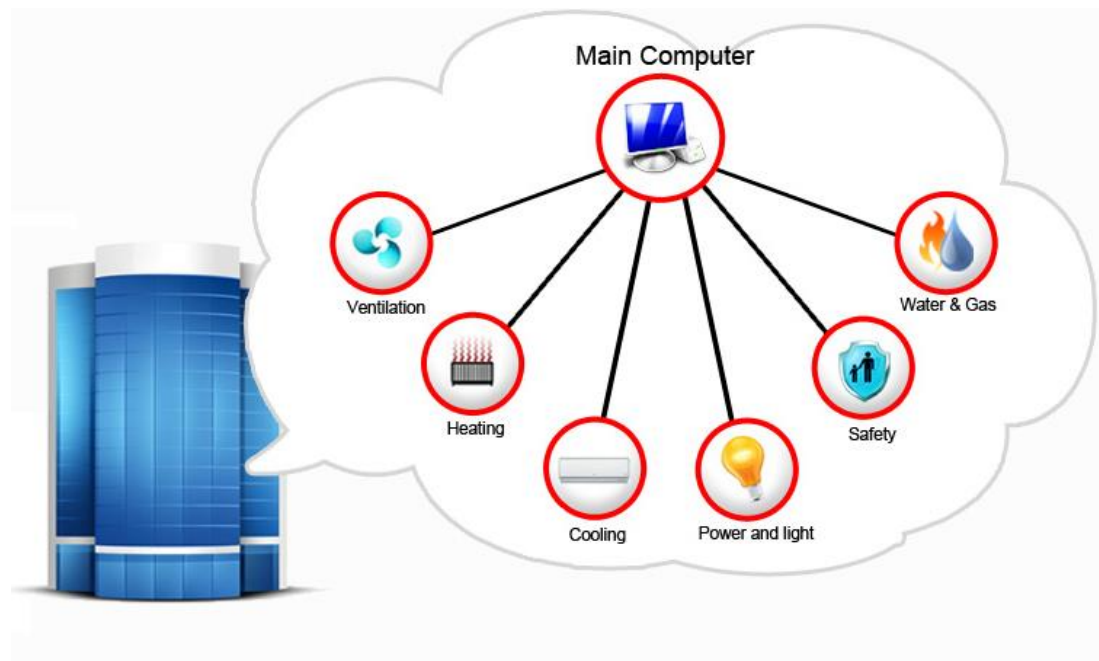
2.1.5 Construction Environmental Management

A Construction Environmental Management Plan (CEMP) will be developed and implemented by the head contractor. This CEMP will be critical to assist with managing the environmental performance, conditions, and impacts arising from excavations, the demolition work and the construction of the proposed buildings.

2.1.6 Operational Waste

Facilities will be provided for the collection, storage and separation of distinct waste streams for collection by the relevant waste contractors. A Waste Management Plan (WMP) will be provided for building operations. In addition, strategies such as well-located recycling facilities (for both the residential and retail/commercial zones) will be incorporated, to increase the ease of recycling.

A detailed operational waste management plan (OWMP) has also been prepared. This OWMP details all recycling and waste management for the various building zones, during the operational phase.



2.2 Indoor Environmental Quality

Indoor Environmental Quality (IEQ) will be improved through consideration of indoor air quality, acoustic conditions, thermal comfort, visual comfort, daylighting and external views. The various IEQ strategies are outlined in more detail below.

2.2.1 Indoor Air Quality

The ventilation system for the building will be designed under the guidance of ASHRAE Standards, for issues such as separation distances between pollution sources and air intakes. Ductwork will also be protected during construction to ensure it remains free of moisture and debris prior to occupation.

Preference will be given to paints, adhesives, sealants, floor coverings and engineered wood products with low Volatile Organic Compound (VOC) emissions and low formaldehyde emissions. This will help to minimise indoor air contamination and to promote occupant health. For products with potential VOC emissions, priority will be given to E0 and Super E0, where possible, since these have significantly lower emissions than products with E2 ratings and below.

2.2.2 Acoustic Comfort

The design has considered acoustic comfort in detail, including general noise levels, reverberation and noise separation. For example, acoustic insulation has been proposed between apartments and corridors and this was selected to provide both acoustic and thermal comfort benefits.

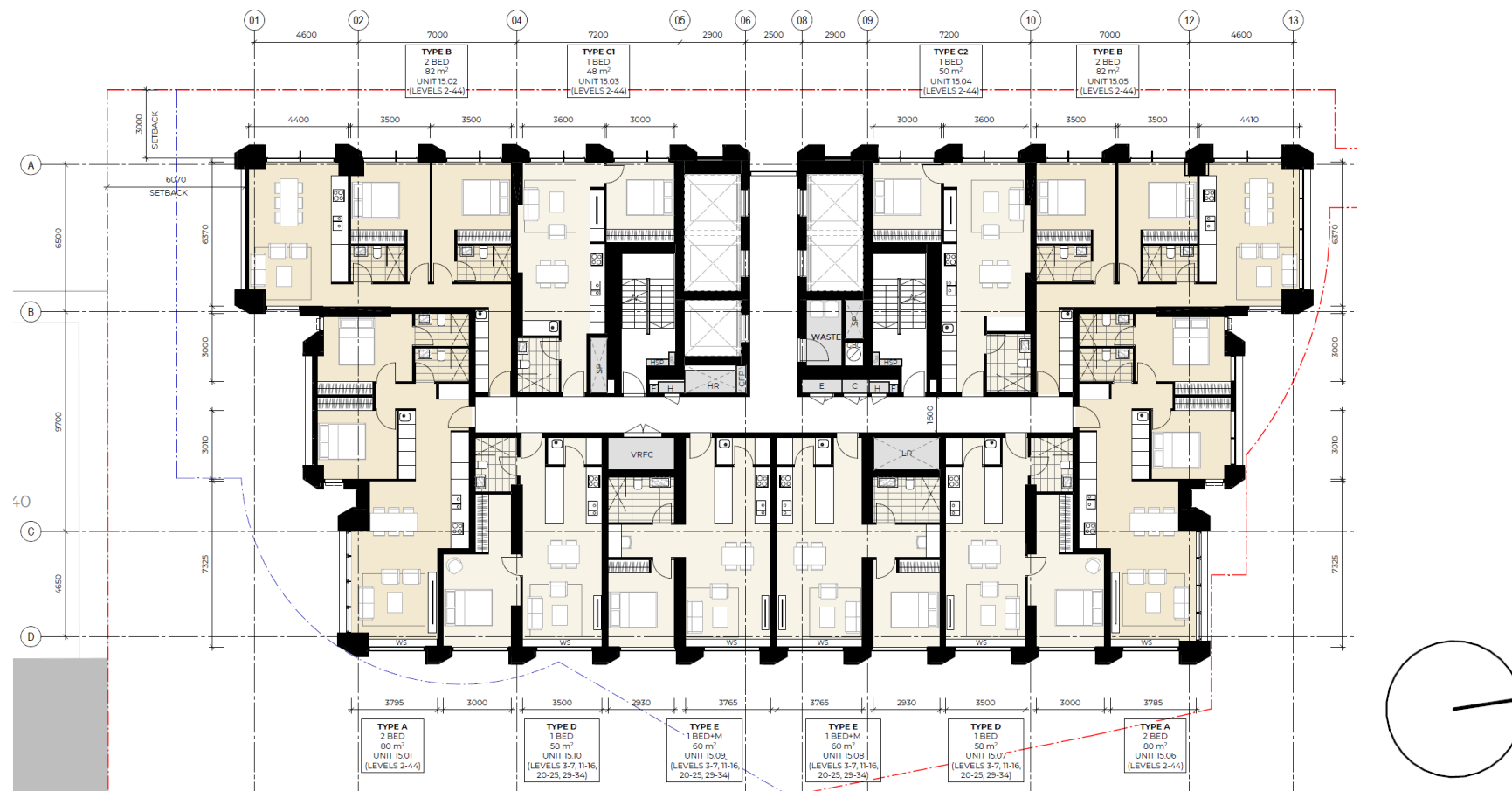
2.2.3 Visual Comfort

Glare control mechanisms such as internal blinds and shading devices will assist in maximizing visual comfort for the occupants. The design has also carefully considered the availability of daylight and external views. Furthermore, artificial lighting will consider appropriate colour perception and lighting levels, reduced glare from lamps and uniformity.

2.2.4 Daylighting

Simulations by the design team have shown excellent solar access to most dwellings, across the building. The fortunate position, orientation and surrounding environment, have allowed for this. The increased daylighting will improve the indoor environment and reduce the reliance on electric lighting. It will also improve productivity, health and overall well-being. The good thermal comfort results have shown that daylighting was not implemented at the expense of overheating. The NatHERS results were excellent and cooling estimates were superb, as discussed.





Solar Access evident for typical units (by Woods Bagot) - 146 Arthur Street, North Sydney, NSW 2060

2.2.5 Thermal Comfort

Performance glazing with some external shading will be utilised intelligently to improve thermal comfort for the occupants. Indeed, passive heating, passive cooling and natural ventilation have been carefully considered. To balance daylighting and views with thermal comfort, various performance-glazing products have been proposed (such as double-glazing for all apartments and priority zones). The glazing specifications were based on BASIX thermal comfort scores, to ensure that the correct glass is utilised for various orientations and building types.



It is also recognised that thermal comfort is extremely important for BASIX and sustainable design, however the windows also affect other important ESD issues. Therefore, a very careful and deliberate balance was made by the design team, to ensure good thermal comfort, minimal glare, good daylighting and connection to external views.

For example, the use of some darker tinting was implemented for thermal comfort, privacy and glare reduction. However, too much tinting can make rooms unnecessarily dark (and less effective with passive heating in winter) so lighter tints were often selected, if they were passing BASIX targets. The use of glazed balustrades was also implemented, to create exciting building aesthetics and to optimise passive heating and daylighting, through the building facades.

2.3 Energy

The design will seek to reduce energy consumption and greenhouse gas (GHG) emissions, by combining a well-designed building envelope and high-efficiency systems and services. Furthermore, smart controls, meters and automation will ensure that the major building services only operate when needed. Passive design principles have also been integrated (as discussed above) to reduce the demand on active systems such as HVAC and lighting.

2.3.1 National Construction Code Section J for Energy Efficiency

The NCC's Section J (National Construction Code) determines the minimum energy performance requirements for all new developments in Australia. The proposed design will meet all the NCC's Section J energy efficiency requirements. A detailed Section J summary report has already been prepared, to demonstrate the design strategies to comply with NCC 2022 Section J, under the DTS assessment. Section J DTS testing has indicated that the retail zones will pass comfortably, since generous insulation and performance glazing is also being proposed in these zones, similar to the apartment designs.

The Section J report, has also been prepared, and this looks in detail at each of the following energy categories:

- o Part J1 Energy efficiency performance requirements
- o Part J2 Energy efficiency
- o Part J3 Elemental provisions for a sole-occupancy unit of a Class 2 or Class 4
- o Part J4 Building fabric
- o Part J5 Building sealing
- o Part J6 Air-conditioning and ventilation
- o Part J7 Artificial lighting and power
- o Part J8 Heated water supply and swimming pool and spa pool plant
- o Part J9 Energy monitoring and on-site distributed energy resources

Importantly, the "conditioned" zones will include the retail and apartment zones (but not hallways, plant rooms, pool rooms or back-of-house zones such as plant rooms or fire stairs). Even if air-conditioning is not proposed for some "habitable" parts of those building types, those zones will still be classified as "conditioned", for the purpose of the DTS analysis. This will ensure that all those high-importance areas have an excellent level of passive thermal comfort.

2.3.2 Energy reduction strategies

The following strategies have been embraced to improve energy efficiency:

- Use of renewable energy sources including generous PV solar power.
- Low-carbon hot water systems (electric heat pumps, air-sourced)
- Efficient heating, ventilation and cooling (HVAC) systems including:
 - High efficiency condensers, pumps, fans, etc
 - Sensors or BMS to monitor and control building systems
 - Ventilation with efficiency controls such as zoning and occupancy sensors
 - Carbon Monoxide sensors and variable VSD fans in basement levels
 - Common area ventilation to include efficiency controls such as zoning, motion sensors and time clock controls



- Passive systems such as passive heating, passive cooling and natural ventilation (through the intelligent use and positioning of thermal mass, window openings, glazing, shading devices, etc).
- Efficient lighting, sensors and efficiency controls (with mainly LED lights). This includes internal, external and public domain lighting.
- Efficient whitegoods, fixtures and fittings for energy. In particular, the whitegoods have a huge influence (on per capita energy use) so excellent dryers and dishwashers will be provided (to educate the residents and also to boost the already high BASIX scores).
- Some areas with shut-off switches for lights and non-essential power to be turned off when unoccupied.
- Appliances and whitegoods (as listed previously) will have very high energy efficiency ratings.
- Efficient taps, showers and water-consuming whitegoods, which will hence reduce the hot water use, per capita.
- Minimised infiltration through weather stripping for doors and windows, dampers for exhaust fans and compliance with Section J.

These energy strategies will also contribute to reducing peak electrical demand from the development. This factor is very important when it comes to reducing the stress on the surrounding energy networks and infrastructure.

2.4 Transport

The following alternative transport initiatives are being proposed to improve amenity, to promote occupant health and to reduce transport related GHG emissions.

2.4.1 Active Transport Facilities

Secured bicycle parking and associated facilities have been provided for patrons and visitors. Travel information kits for residents and workers will be generated later. This will encourage public transport, walking, bicycles and carshare schemes (over private motor vehicle use). The provision of shared bathroom facilities has also been implemented for non-residential components of the building, and this will encourage staff to cycle to work.



2.4.2 Walkable Neighbourhood & Public Transport

The site is located close to numerous amenities, with a 'walk score' of 29 and a transit score of 84 (see below).

146 Arthur Street

North Sydney, Sydney, 2060

Commute to **Downtown Sydney**

5 min
 18 min
 60+ min
 48 min
 [View Routes](#)

[Favorite](#)
[Map](#)
[Nearby Apartments](#)

Walk Score

29

Car-Dependent

Most errands require a car.

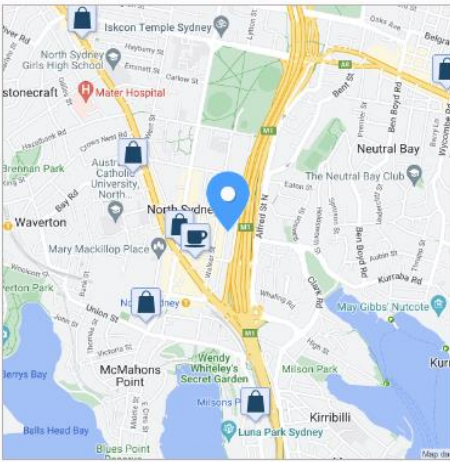
Transit Score

84

Excellent Transit

Transit is convenient for most trips.

[About your score](#)
[Add scores to your site](#)



About this Location

146 Arthur Street has a Walk Score of 29 out of 100. This location is a Car-Dependent neighborhood so most errands require a car.

146 Arthur Street is a seven minute walk from the Central Coast and Newcastle Line and the T1 North Shore and Northern Line at the North Sydney Station Platform 4 stop.

This location is in the North Sydney neighborhood in Sydney. Nearby parks include Dorris Fitton Park, Warringa Park and Alfred Street North Park.

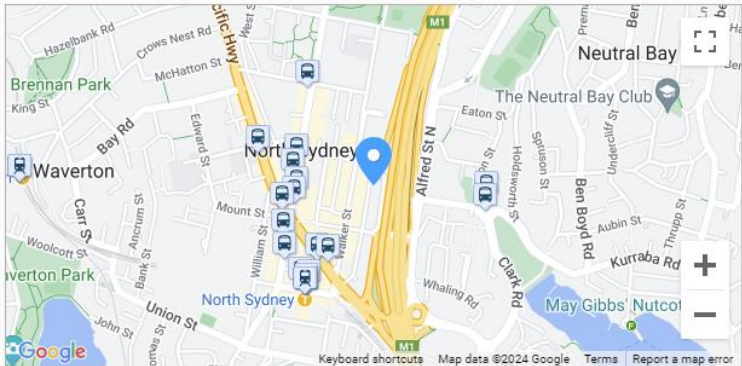
Consequently, the project has been designed to optimise connectivity and pedestrian links within the site itself for "enhanced walkability". This will allow access to the numerous features within the site itself. The corner aspect of the site has been taken advantage of and there are now numerous (easily accessed) entrance zones to the buildings.

The convenience, aesthetics and safety of the design have been carefully considered to encourage users to walk and cycle, rather than driving cars.


Excellent Transit

[Add to your site](#)

146 Arthur Street has excellent transit which means transit is convenient for most trips.



Rail lines:

Central Coast and Newcastle...	0.4 km	T1 North Shore and Northe...	0.4 km
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Bus lines:

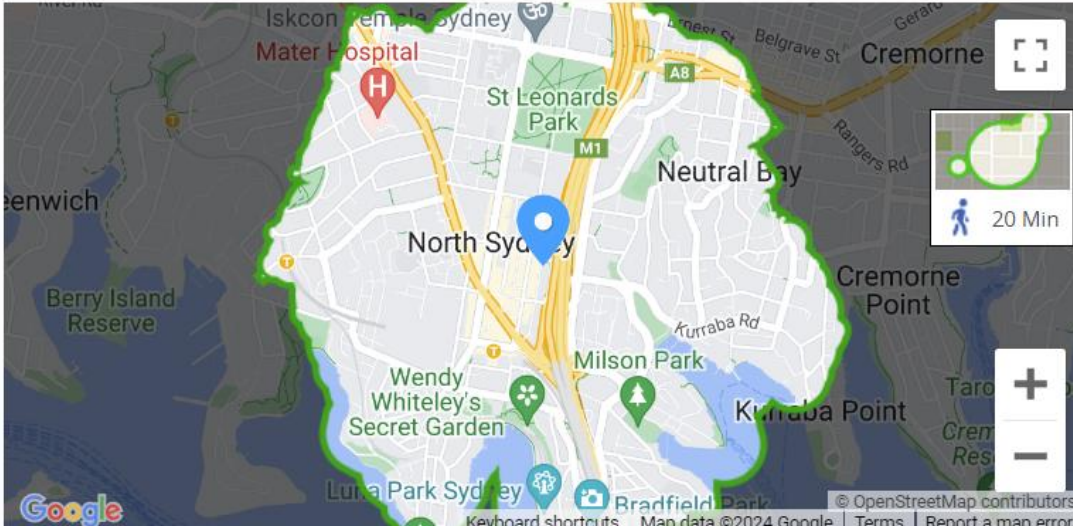
184 City to Mona Vale	0.3 km	L87 Milsons Point to Newpo...	0.3 km
227 Milsons Point to Mosman	0.3 km	L84 Milsons Point to Mona ...	0.3 km
L78 Milsons Point to Dee W...	0.3 km	287 Milsons Point to Ryde	0.3 km
230 Milsons Point to Mosm...	0.3 km	209 Milsons Point to East Li...	0.3 km
173 Milsons Point to Narra...	0.3 km	229 Milsons Point to Beauty...	0.3 km

[Less](#)

Travel Time Map

[Add to your site](#)

Explore how far you can travel by car, bus, bike and foot from 146 Arthur Street.



2.4.2 Electric car recharging stations

To encourage sustainable motor-vehicles, electric-car recharging facilities have been carefully considered, for future installation. Electric car-charging capabilities have been proposed for the development (with charging facilities and switchboards to be compliant with the new NCC 2022 Section J provisions). Travel information kits for residents and workers will also be generated later.

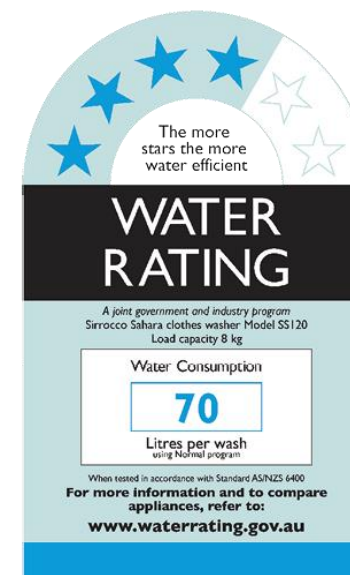
2.5 Water

Potable water consumption will be minimised for the project by selecting very water-efficient fittings, fixtures and appliances. As shown by the BASIX specifications, products were generally selected within 1 star of the top star rating (using the WELS website). For example, toilets can be awarded up to 5 stars, so the architects chose 4-star ratings. Importantly, the top ratings can be very difficult from a cost, availability or functionality perspective. For example, a 5-star toilet requires a basin above the toilet cistern, and this is clearly not suitable for most designs.

2.5.1 Water strategies

The following strategies will be used to reduce potable water consumption. These initiatives may change slightly as detailed design is developed.

- Water efficient fittings and fixtures (especially taps, showers and toilets)
- Water efficient appliances (especially dishwashers)
- Rainwater harvesting and re-use on the site (20 kL minimum, for rainwater storage)
- Rainwater reuse for irrigation and car wash
- Recycling or reuse (closed loops) of any water required for fire testing.
- Efficient irrigation such as drip irrigation to planters and gardens
- At least 50% use by area of locally indigenous or “one-drop” water-efficient plants
- Generous deep-soil allocation
- Generous garden areas and green-roof gardens/planters, with low-water species



2.6 Materials

2.6.1 Material Selection

Materials used in the building industry are responsible for significant waste generation, resource depletion, GHG emissions and water consumption. To minimise these environmental impacts, the following principles will be considered for material selection on the site, as the design progresses:

- Selection of certified timbers, especially those with FSC-certification
- Consider Best Practice PVC products (or aim for avoidance of PVC, if possible)
- Design major building components for longevity, adaptation, disassembly, re-use and recycling
- Local procurement to support the local economy and reduce transport emissions
- Design for robustness - review the design and the materials to ensure durability for high-traffic surfaces and high-use fittings.
- Specification of sustainable products where appropriate, such as those with recycled content or potential for recycling
- Specification of products with third-party certifications (e.g., GECA or GreenTag) or those with EPDs (Environmental Product Declarations)
- Consider and implement 'green steel products', where feasible, from accredited steel makers and fabricators
- Consider and implement cement-replacements in concrete, where feasible, by using low-carbon options and fly ash. Detailed studies will be undertaken in design development to maximise this low-carbon approach.



2.6.2 Waste minimisation

A Waste Minimisation Plan has also been prepared to outline best practice waste management during the design, construction and operation of the project. The proposed waste strategy looks at issues such as:

- Establish waste targets (including minimum construction and demolition waste recycling targets).
- ‘Design out’ waste: Reduce the amount of materials used in the construction processes, wherever practical
- Implement best practice construction waste management plans and engage with the supply chain.
- Provide infrastructure and clear guidance (for the building users) to maximise waste recycling during operation.

The Head Contractor will develop a Construction Waste Management Plan (CWMP) in accordance with waste targets and this will:

- Define responsibilities and actions to prevent, reduce and recover waste
- Strive to recycle >90% by weight of construction and demolition waste
- Set a target of 70% operational waste to be diverted from landfill including compostable organics and green waste.
- Identify the waste arising from construction and detail waste reuse and recycling routes
- Record waste movements and quantities during construction and benchmark the results against best practice targets



2.7 Land Use & Ecology

The project will enhance existing ecological value by reusing a previously developed site. Consequently, the objective of the landscaping and ecology strategies will be to restore the ecological value of the site and use locally indigenous species around the site. This will help to reduce water consumption and also to enhance biodiversity and the restoration of native flora and fauna in the area.

2.8 Emissions

Emissions to water, soil and the sky will be minimised during construction and operation. A CEMP will be prepared for the site demolition and construction and the emissions will be addressed in this document.

2.8.1 Reduced Peak Discharge to Stormwater

The post-development peak event stormwater discharge from the site will not exceed the pre-development peak event stormwater discharge.

Stormwater discharged from the site will be designed to achieve high levels of pollution removal for pollutants such as total suspended solids, gross pollutants, total nitrogen, total phosphorus, petroleum hydrocarbons and free oils.

2.8.2 Light Pollution

Outdoor lighting on the project will generally be designed in accordance with AS 4282:1997 and external light pollution will be minimised. The reduction in light pollution will alleviate the risk of impacts on neighbours and wildlife.



2.8.3 Heat Island Effect

Lighter-coloured pavements, walls and roofs (and generous planting) have been proposed, in most locations, as shown in the plans, sections, renders and elevations. This strategy was mainly conceived in order to reduce the potential heat island effect on the site and surrounding areas. Furthermore, this strategy will also improve internal thermal comfort, significantly, in summer.

2.8.4 Refrigerant impacts

Refrigerants will be selected to try and target an Ozone Depletion Potential (ODP) of zero.

This includes most air conditioning systems and other refrigeration equipment. This may entail various HVAC&R systems and cold/freezer rooms found in the premises.

Environmental impacts from refrigerants leaking into the atmosphere must be minimised as far as possible, in order for this objective to be achieved.

2.8.5 Solar Reflectivity

Glass surfaces (and some other cladding materials) can be highly reflective. Various measures will be used to negate this effect and, in particular, low-reflectivity glass will be used, in accordance with council requirements.

The main issues with reflectivity will typically occur at the lower levels, since this is where motorists, pedestrians and public transport operators will be focusing their gaze. This zone of peripheral vision is extremely important for solar reflectance, especially for motorists and train/bus drivers.

With this in mind, the building will use exclusively low-reflective materials and glass at the lower levels. This building (and other similar buildings nearby) have been investigated, for potential reflectivity. It was concluded that a conservative “reflectivity target” of 20% should be adequate to prevent negative issues with solar reflectance. Most councils support that conservative figure and (reflectivity index permitted for external glazed elements should not exceed a 20% value).

If the 20% reflectivity target is successful for the lower levels, then the higher levels will work as well (or even better) with that same solar reflectivity. Hence, overall, the 20% target should work well, for the proposed facades of the towers.

In addition to the low-reflectivity glazing, various other measures will also be used to negate unwanted reflection. In particular, vertical fins and building articulation, will be used, in accordance with council's general recommendations. The additional shading devices have been incorporated for thermal benefits, privacy and reflectivity benefits, at all levels.

The final glazing products will be carefully selected, with these targets in mind. Importantly, the thermal comfort, acoustic and reflectivity targets should all be compatible, with the targets listed above.

2.9 Community

The project will be designed to maximise community benefit. In particular, it will encourage active lifestyles, maintain good pedestrian and cyclist linkages and facilitate ample, safe social interaction. The project will also be designed to minimise other undesirable impacts on the community such as glare and light pollution.

The following strategies will be considered:

- Marketing and education strategies to convey the numerous sustainability practices to wider audiences
- Ensuring that the design and the building materials do not lead to hazardous, undesirable or uncomfortable glare to pedestrians, motorists or occupants of surrounding buildings
- Minimise light spill to the sky.
- Promotion of healthy and active living through various design and education strategies (for example, with cycling storage and facilities)
- Incorporation of crime prevention through environmental design (CPTED)

3. Conclusion

The numerous initiatives outlined in this report demonstrate how the proposed development will incorporate best practice ESD initiatives into its design, construction and ongoing operation. Through a combination of energy, water and other ESD strategies, the project will indeed exceed the minimum requirements for sustainable development.

It is acknowledged that some strategies will need further refinement, during the latter stages of design. Strategies to be explored and refined in the future design stages include:

- Refinement of renewable energy design (such as final PV type and sizing, to optimise all available space)
- Energy-efficient building fabric and services to deliver optimal energy savings
- Energy-efficient windows (double-glazing and performance frames) to maximise thermal comfort, natural daylighting and views
- Careful lighting design (further refinement for both energy efficiency and "indoor environment quality")
- Selection of non-toxic materials, finishes, adhesives and products to improve Indoor Environmental Quality (IEQ)
- Final brand and model selection for efficient fittings, fixtures and appliances (noting that better options may be available in 1-2 years)
- Water-reuse balance, with an intelligent synergy between the reuse strategies for rainwater and future treated-wastewater supply
- Active transport facilities to encourage healthier living while reducing carbon emissions from transport
- Selective procurement of materials and internal finishings (to minimise any possible environmental and social impacts)
- Management and governance procedures (which will improve sustainability outcomes during operation).

As detailed earlier, the project will be designed under the guidance of BASIX, NatHERS, NCC's Section J Energy Efficiency and also the North Sydney Development Control Plan (DCP) 2013. Furthermore, the energy testing and calculations suggest that the building will perform very well in relation to energy demands and greenhouse gas emissions.

4. Appendix 1 – BASIX and NatHERS Certificates

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 1742516M

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: Friday, 05 April 2024

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



Project summary

Project name	146 ARTHUR STREET NORTH SYDNEY - Part 1 of 2
Street address	146 ARTHUR STREET NORTH SYDNEY 2060
Local Government Area	NORTH SYDNEY
Plan type and plan number	Deposited Plan 788579
Lot No.	1
Section no.	-
No. of residential flat buildings	1
Residential flat buildings: no. of dwellings	195
Multi-dwelling housing: no. of dwellings	0
No. of single dwelling houses	0

Project score

Water	✓ 43	Target 40
Thermal Performance	✓ Pass	Target Pass
Energy	✓ 63	Target 63
Materials	✓ -77	Target n/a

Certificate Prepared by

Name / Company Name: INTEGREGO CONSULTING PTY LTD

ABN (if applicable): 42630013008

Description of project

Project address	
Project name	146 ARTHUR STREET NORTH SYDNEY - Part 1 of 2
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Local Government Area	NORTH SYDNEY
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Lot No.	1
Section no.	-
Project type	
No. of residential flat buildings	1
Residential flat buildings: no. of dwellings	195
Multi-dwelling housing: no. of dwellings	0
No. of single dwelling houses	0
Site details	
Site area (m ²)	1641
Roof area (m ²)	326
Non-residential floor area (m ²)	157
Residential car spaces	33
Non-residential car spaces	0

Common area landscape		
Common area lawn (m ²)	0	
Common area garden (m ²)	350	
Area of indigenous or low water use species (m ²)	175	
Assessor details and thermal loads		
Assessor number	DMN/19/1921	
Certificate number	0009344520	
Climate zone	17	
Project score		
Water	✔ 43	Target 40
Thermal Performance	✔ Pass	Target Pass
Energy	✔ 63	Target 63
Materials	✔ -77	Target n/a

Description of project

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

Residential flat buildings - Building1, 195 dwellings, 47 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)
0201	2	81	0	0	0
0205	2	81	0	0	0
0209	2	85	0	0	0
0304	1	50	0	0	0
0308	1	60	0	0	0
0402	2	81	0	0	0
0406	2	81	0	0	0
0410	1	58	0	0	0
0504	1	50	0	0	0
0508	1	60	0	0	0
0602	2	81	0	0	0
0606	2	81	0	0	0
0610	1	58	0	0	0
0704	1	50	0	0	0
0708	1	60	0	0	0
0802	2	81	0	0	0
0806	2	81	0	0	0
0902	2	81	0	0	0
0906	2	81	0	0	0
1002	2	81	0	0	0
1006	2	81	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)
0202	2	81	0	0	0
0206	2	81	0	0	0
0301	2	81	0	0	0
0305	2	81	0	0	0
0309	1	60	0	0	0
0403	1	48	0	0	0
0407	1	58	0	0	0
0501	2	81	0	0	0
0505	2	81	0	0	0
0509	1	60	0	0	0
0603	1	48	0	0	0
0607	1	58	0	0	0
0701	2	81	0	0	0
0705	2	81	0	0	0
0709	1	60	0	0	0
0803	1	48	0	0	0
0807	2	85	0	0	0
0903	1	48	0	0	0
0907	2	85	0	0	0
1003	1	48	0	0	0
1007	2	85	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)
0203	1	48	0	0	0
0207	2	85	0	0	0
0302	2	81	0	0	0
0306	2	81	0	0	0
0310	1	58	0	0	0
0404	1	50	0	0	0
0408	1	60	0	0	0
0502	2	81	0	0	0
0506	2	81	0	0	0
0510	1	58	0	0	0
0604	1	50	0	0	0
0608	1	60	0	0	0
0702	2	81	0	0	0
0706	2	81	0	0	0
0710	1	58	0	0	0
0804	1	50	0	0	0
0808	2	85	0	0	0
0904	1	50	0	0	0
0908	2	85	0	0	0
1004	1	50	0	0	0
1008	2	85	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)
0204	1	50	0	0	0
0208	1	71	0	0	0
0303	1	48	0	0	0
0307	1	58	0	0	0
0401	2	81	0	0	0
0405	2	81	0	0	0
0409	1	60	0	0	0
0503	1	48	0	0	0
0507	1	58	0	0	0
0601	2	81	0	0	0
0605	2	81	0	0	0
0609	1	60	0	0	0
0703	1	48	0	0	0
0707	1	58	0	0	0
0801	2	81	0	0	0
0805	2	81	0	0	0
0901	2	81	0	0	0
0905	2	81	0	0	0
1001	2	81	0	0	0
1005	2	81	0	0	0
1101	2	81	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)
1102	2	81	0	0	0
1106	2	81	0	0	0
1110	1	58	0	0	0
1204	1	50	0	0	0
1208	1	60	0	0	0
1302	2	81	0	0	0
1306	2	81	0	0	0
1310	1	58	0	0	0
1404	1	50	0	0	0
1408	1	60	0	0	0
1502	2	81	0	0	0
1506	2	81	0	0	0
1510	1	58	0	0	0
1604	1	50	0	0	0
1608	1	60	0	0	0
1702	2	81	0	0	0
1706	2	81	0	0	0
1802	2	81	0	0	0
1806	2	81	0	0	0
1902	2	81	0	0	0
1906	2	81	0	0	0
2002	2	81	0	0	0
2006	1	58	0	0	0
2101	2	81	0	0	0
2105	2	81	0	0	0
2109	1	60	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)
1103	1	48	0	0	0
1107	1	58	0	0	0
1201	2	81	0	0	0
1205	2	81	0	0	0
1209	1	60	0	0	0
1303	1	48	0	0	0
1307	1	58	0	0	0
1401	2	81	0	0	0
1405	2	81	0	0	0
1409	1	60	0	0	0
1503	1	48	0	0	0
1507	1	58	0	0	0
1601	2	81	0	0	0
1605	2	81	0	0	0
1609	1	60	0	0	0
1703	1	48	0	0	0
1707	2	85	0	0	0
1803	1	48	0	0	0
1807	2	85	0	0	0
1903	1	48	0	0	0
1907	2	85	0	0	0
2003	1	50	0	0	0
2007	1	60	0	0	0
2102	2	81	0	0	0
2106	2	81	0	0	0
2110	1	58	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)
1104	1	50	0	0	0
1108	1	60	0	0	0
1202	2	81	0	0	0
1206	2	81	0	0	0
1210	1	58	0	0	0
1304	1	50	0	0	0
1308	1	60	0	0	0
1402	2	81	0	0	0
1406	2	81	0	0	0
1410	1	58	0	0	0
1504	1	50	0	0	0
1508	1	60	0	0	0
1602	2	81	0	0	0
1606	2	81	0	0	0
1610	1	58	0	0	0
1704	1	50	0	0	0
1708	2	85	0	0	0
1804	1	50	0	0	0
1808	2	85	0	0	0
1904	1	50	0	0	0
1908	2	85	0	0	0
2004	2	81	0	0	0
2008	1	60	0	0	0
2103	1	48	0	0	0
2107	1	58	0	0	0
2201	2	81	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)
1105	2	81	0	0	0
1109	1	60	0	0	0
1203	1	48	0	0	0
1207	1	58	0	0	0
1301	2	81	0	0	0
1305	2	81	0	0	0
1309	1	60	0	0	0
1403	1	48	0	0	0
1407	1	58	0	0	0
1501	2	81	0	0	0
1505	2	81	0	0	0
1509	1	60	0	0	0
1603	1	48	0	0	0
1607	1	58	0	0	0
1701	2	81	0	0	0
1705	2	81	0	0	0
1801	2	81	0	0	0
1805	2	81	0	0	0
1901	2	81	0	0	0
1905	2	81	0	0	0
2001	2	81	0	0	0
2005	2	81	0	0	0
2009	1	58	0	0	0
2104	1	50	0	0	0
2108	1	60	0	0	0
2202	2	81	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
2203	1	48	0	0	0
2207	1	58	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
2204	1	50	0	0	0
2208	1	60	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
2205	2	81	0	0	0
2209	1	60	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
2206	2	81	0	0	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)	Common area	Floor area (m²)	Common area	Floor area (m²)
Lift bank (No. 1)	-	Lift bank (No. 2)	-	Indoor swimming pool and spa area	156
Gym area	47	Undercover car park area	2035	Switch rooms	23
Garbage rooms lower	54	Garbage rooms upper	103	Community 1 - kids play	24
Community 2 - cinema	21	Community 3 - games room	9	Community 4 - lounge circulation	49
Community 5 - residential lounge	70	Community 6 - main lounge	95	Community 7 - flex/community lower	133
Community 8 - co-work lower	35	Community 9 - co work sky bridge	33	Community 10 - community rooms top	80
Community 11 - bookable rooms top	102	Plant or service rooms	149	Plant fan rooms	25
Plant substation	56	Plant circulation areas	82	Plant upper levels	24
Office in main lobby	3	Bike storage	128	Toilets residential	33
Storage and bulky store	116	Ground floor lobbies	113	Hallway/lobby upper levels	1364

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building1

(a) Buildings

(i) Materials

(b) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Performance

(c) Common areas and central systems/facilities

(i) Water

(ii) Energy

2. Commitments for multi-dwelling housing

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Performance

3. Commitments for single dwelling houses

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Performance

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

(b) Common areas and central systems/facilities

(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) Buildings

(i) Materials	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) 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 "Floor types", "External wall types", "Internal wall types", "Ceiling and roof types", "Frames" and "Glazing" tables below.			✓
(b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.		✓	
(c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the "Frames" and "Glazing" tables is permitted.	✓	✓	✓
(d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.			✓

Floor types

Floor type	Area (m2)	Insulation	Low emissions option
concrete slab on ground, frame:	745	-	none
suspended floor above garage, frame: suspended concrete slab	1790	foil-foam composite board	none
suspended floor above open subfloor, frame: suspended concrete slab	335	foil-foam composite board	none
floors above habitable rooms, frame: suspended concrete slab	14820	-	none

External wall types

External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 1	concrete panel/ plasterboard, frame: light steel frame	5120	none	rockwool batts, roll or pump-in

External wall types				
External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 2	framed (metal clad),frame:light steel frame	4280	none	rockwool batts, roll or pump-in
External wall type 3	brick veneer,frame:light steel frame	1185	none	rockwool batts, roll or pump-in

Internal wall types			
Internal wall type	Construction type	Area (m2)	Insulation
Internal wall type 1	plasterboard, frame:light steel frame	9420	rockwool batts, roll or pump-in
Internal wall type 2	single skin masonry, frame:light steel frame	1230	rockwool batts, roll or pump-in
Internal wall type 3	75 mm AAC panel, frame:light steel frame	12825	rockwool batts, roll or pump-in

Reinforcement concrete frames/columns		
Building has reinforced concrete frame/columns?	Volume (m³)	Low emissions option
yes	2540	-

Ceiling and roof types			
Ceiling and roof type	Area (m²)	Roof Insulation	Ceiling Insulation
concrete - plasterboard internal, frame: light steel frame	681	-	foil-foam composite board

Glazing types			Frame types				
Single glazing (m²)	Double glazing (m²)	Triple glazing (m²)	Aluminium frames (m²)	Timber frames (m²)	uPVC frames (m²)	Steel frames (m²)	Composite frames (m²)
0	5415	0	5415	0	0	0	0

(b) 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 (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	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
All dwellings	No alternative water supply	-	-	-	-	-	-	-
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(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.		✓	✓
(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:			

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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 (No. 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

	Cooling		Heating		Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bathrooms or toilets	Main kitchen
0202, 0205, 0302, 0305, 0402, 0405, 0502, 0505, 0602, 0605, 0702, 0705, 0802, 0805, 0902, 0905, 1002, 1005, 1102, 1105, 1202, 1205, 1302, 1305, 1402, 1405, 1502, 1505, 1602, 1605, 1702, 1705, 1802, 1805, 1902, 1905, 2002, 2005, 2102, 2105, 2202, 2205	Central cooling system (No. 1)	Central cooling system (No. 1)	Central heating system (No. 1)	Central heating system (No. 1)	0	yes
All other dwellings	Central cooling system (No. 1)	Central cooling system (No. 1)	Central heating system (No. 1)	Central heating system (No. 1)	0	no

	Individual pool			Individual spa		Appliances other efficiency measures				
Dwelling no.	Pool heating system	Pool Pump	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Dishwasher	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	-	induction cooktop & electric oven	4 star	8.0 star	no	no

(iii) Thermal Performance	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.	✓	✓	✓
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✓		

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.			

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
0201	33.00	4.30	37.300
0202	29.20	4.40	33.600
0203	3.30	17.30	20.600
0204	14.800	11.10	25.900
0205	8.80	7.90	16.700
0206	5.20	6.70	11.900
0207	13.40	13.70	27.100
0208	6.50	5.10	11.600
0209	8.30	11.60	19.900
0301	21.50	4.50	26.000
0302	16.80	5.70	22.500
0303	3.60	17.10	20.700
0304	3.90	15.90	19.800
0305	5.20	8.80	14.000
0306	2.80	8.300	11.100
0307	4.50	17.60	22.100
0308	4.30	11.90	16.200
0309	4.80	11.60	16.400
0310	3.90	16.00	19.900
0402	17.20	5.30	22.500
0403	3.90	17.30	21.200
0404	4.20	15.50	19.700
0405	5.60	8.70	14.300
0406	2.90	8.20	11.100
0407	5.10	16.00	21.100
0408	4.90	10.90	15.800

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
0409	5.30	10.60	15.900
0410	4.40	14.60	19.000
0502	17.50	5.10	22.600
0503	4.10	16.60	20.700
0504	4.40	15.40	19.800
0505	5.80	8.20	14.000
0506	3.10	8.00	11.100
0507	4.90	16.60	21.500
0508	4.80	11.30	16.100
0509	5.30	11.10	16.400
0510	4.30	15.40	19.700
0601	22.500	4.50	27.000
0602	17.80	4.80	22.600
0603	4.400	16.50	20.900
0604	4.70	15.40	20.100
0605	5.90	7.80	13.700
0606	3.20	7.80	11.000
0607	5.20	16.50	21.700
0608	5.00	10.90	15.900
0609	5.50	10.80	16.300
0610	4.50	14.90	19.400
0701	23.00	4.50	27.500
0702	18.20	4.90	23.100
0703	4.60	16.50	21.100
0704	4.90	15.10	20.000
0705	6.20	7.90	14.100
0706	3.40	8.10	11.500
0707	5.70	15.20	20.900
0708	13.30	13.00	26.300
0709	13.90	12.80	26.700
0710	5.00	13.60	18.600

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
0801	24.60	4.60	29.200
0802	18.200	4.70	22.900
0803	4.70	16.10	20.800
0804	5.00	15.30	20.300
0806	3.50	7.70	11.200
0807	11.70	11.20	22.900
0808	12.60	9.30	21.900
0902	18.20	4.80	23.000
0903	4.90	15.90	20.800
0904	5.00	15.90	20.900
0905	6.20	10.70	16.900
0906	4.30	7.00	11.300
0907	11.90	10.90	22.800
0908	12.80	9.10	21.900
1001	25.00	4.60	29.600
1002	18.30	4.60	22.900
1003	4.60	17.20	21.800
1004	4.90	15.80	20.700
1007	12.60	9.90	22.500
1008	13.40	8.40	21.800
1102	17.600	5.40	23.000
1103	4.60	16.90	21.500
1104	4.30	17.50	21.800
1105	6.10	11.00	17.100
1107	6.90	12.30	19.200
1108	17.60	5.90	23.500
1109	18.30	6.00	24.300
1110	6.20	10.90	17.100
1201	24.40	4.90	29.300
1202	21.60	3.10	24.700
1203	4.20	18.80	23.000

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
1204	4.30	18.60	22.900
1205	5.70	11.70	17.400
1206	4.60	6.90	11.500
1207	7.00	12.30	19.300
1208	7.00	8.10	15.100
1209	7.50	8.00	15.500
1210	6.30	10.70	17.000
1301	22.60	5.00	27.600
1302	19.70	3.000	22.700
1303	5.90	7.30	13.200
1304	5.100	7.00	12.100
1305	9.00	6.00	15.000
1306	4.70	7.20	11.900
1307	7.40	11.3	18.700
1308	7.40	7.40	14.800
1309	7.90	7.30	15.200
1310	6.70	9.70	16.400
1401	23.50	4.80	28.300
1402	10.20	8.70	18.900
1403	3.90	8.90	12.800
1404	3.20	8.70	11.900
1405	6.90	6.700	13.600
1406	4.70	6.90	11.600
1407	7.20	12.00	19.200
1408	7.300	7.90	15.200
1409	7.80	7.60	15.400
1410	6.50	10.10	16.600
1501	23.60	4.80	28.400
1502	12.50	3.70	16.200
1503	2.10	10.60	12.700
1504	1.90	9.60	11.500

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
1505	5.50	7.10	12.600
1506	4.80	6.80	11.600
1507	7.30	11.80	19.100
1508	7.30	7.70	15.000
1509	7.90	7.50	15.400
1510	6.60	10.20	16.800
1601	23.00	5.10	28.100
1602	13.00	3.60	16.600
1603	2.30	10.20	12.500
1604	2.20	8.9	11.100
1605	5.70	6.80	12.500
1606	4.90	7.10	12.000
1607	7.80	10.80	18.600
1608	16.10	8.90	25.000
1609	16.70	8.70	25.400
1610	7.00	9.30	16.300
1701	23.10	5.10	28.200
1702	12.50	3.60	16.100
1703	2.10	10.50	12.600
1704	2.00	9.40	11.400
1705	5.50	7.00	12.500
1706	4.90	7.20	12.100
1707	12.90	9.90	22.800
1708	13.80	8.30	22.100
1801	23.20	5.10	28.300
1802	12.60	3.70	16.300
1803	2.20	10.30	12.500
1804	2.10	9.30	11.400
1805	5.60	7.00	12.600
1806	5.00	7.20	12.200
1807	13.00	9.70	22.700

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
1808	13.900	8.30	22.200
1901	23.400	5.00	28.400
1902	13.300	3.50	16.800
1903	11	11.3	22.300
1904	2.40	8.30	10.700
1905	5.90	6.80	12.700
1906	5.10	7.30	12.400
1907	13.50	9.00	22.500
1908	14.40	7.40	21.800
2001	24.10	4.70	28.800
2002	12.80	3.70	16.500
2003	2.20	9.30	11.500
2004	5.70	6.90	12.600
2005	5.10	7.20	12.300
2006	7.60	11.10	18.700
2007	18.60	5.10	23.700
2008	19.30	5.00	24.300
2009	6.900	9.50	16.400
2101	24.20	4.90	29.100
2102	12.90	3.70	16.600
2103	10.8	7.4	18.200
2104	2.20	9.20	11.400
2105	5.80	6.90	12.700
2106	5.20	7.40	12.600
2107	7.70	10.80	18.500
2108	7.80	7.10	14.900
2109	8.40	6.90	15.300
2110	7.00	9.50	16.500
2201	24.30	4.80	29.100
2202	13.60	3.500	17.100
2203	2.60	9.50	12.100

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
2204	2.50	8.10	10.600
2205	6.20	6.80	13.000
2206	5.30	7.40	12.700
2207	8.20	10.10	18.300
2208	8.300	6.60	14.900
2209	8.80	6.50	15.300
0401, 0501	22.10	4.40	26.500
0805, 1005	6.20	10.50	16.700
0901, 1101	24.50	4.80	29.300
All other dwellings	4.40	6.90	11.300

(c) 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 (> 4.5 but <= 6 L/min)	4 star	5 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Swimming pool (No. 1)	Volume: 47.5 kLs	Location: Indoor swimming pool and/or spa area (No. 1)	-
Spa (No. 2)	Volume: 7 kLs	Location: Indoor swimming pool and/or spa area (No. 1) Spa cover: yes	-
Central water tank - rainwater or stormwater (No. 1)	10000	To collect run-off from at least: - 200 square metres of roof area of buildings in the development - 0 square metres of impervious area in the development - 0 square metres of garden/lawn area in the development - 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 350 square metres of common landscaped area on the site - car washing in 1 car washing bays on the site
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-

Central systems	Size	Configuration	Connection (to allow for...)
Fire sprinkler system (No. 2)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-
Central cooling system (No. 1)	-	Private water meter on make-up line connected to building management system. Conductivity controller installed in the cooling tower.	-

(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
Lift bank (No. 1)	-	-	light-emitting diode	connected to lift call button	yes
Lift bank (No. 2)	-	-	light-emitting diode	connected to lift call button	yes
Indoor swimming pool and spa area	tempered supply air only	time clock or BMS controlled	light-emitting diode	daylight sensors	yes
Gym area	air conditioning system	time clock or BMS controlled	light-emitting diode	daylight sensors	yes
Undercover car park area	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	zoned switching with motion sensor	yes
Switch rooms	ventilation exhaust only	thermostatically controlled	light-emitting diode	motion sensors	yes
Garbage rooms lower	ventilation exhaust only	-	light-emitting diode	motion sensors	yes
Garbage rooms upper	ventilation exhaust only	-	light-emitting diode	motion sensors	yes
Community 1 - kids play	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Community 2 - cinema	air conditioning system	time clock or BMS controlled	light-emitting diode	manual on / manual off	yes
Community 3 - games room	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Community 4 - lounge circulation	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	yes

	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
Community 5 - residential lounge	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 6 - main lounge	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 7 - flex/ community lower	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 8 - co-work lower	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 9 - co work sky bridge	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 10 - community rooms top	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 11 - bookable rooms top	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Plant or service rooms	ventilation exhaust only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Plant fan rooms	no mechanical ventilation	-	light-emitting diode	motion sensors	yes
Plant substation	ventilation exhaust only	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Plant circulation areas	ventilation supply only	none i.e., continuous	light-emitting diode	motion sensors	yes
Plant upper levels	ventilation supply only	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Office in main lobby	air conditioning system	time clock or BMS controlled	light-emitting diode	manual on / manual off	yes
Bike storage	ventilation supply only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Toilets residential	ventilation exhaust only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Storage and bulky store	ventilation supply only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Ground floor lobbies	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Hallway/lobby upper levels	tempered supply air only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes

Central energy systems	Type	Specification
Swimming pool (No. 1)	Heating source: electric heat pump	Pump controlled by timer: yes
Spa (No. 2)	Heating system: electric heat pump	Pump controlled by timer: yes
Sauna (No. 1)	Heating source: electric infrared	Efficiency measure: manual on / timer off
Lift bank (No. 1)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 43 number of levels from the bottom of the lift shaft to the top of the lift shaft: 51 number of lifts: 2 lift load capacity: ≥ 1001 kg but ≤ 1500 kg
Lift bank (No. 2)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 22 number of levels from the bottom of the lift shaft to the top of the lift shaft: 24 number of lifts: 1 lift load capacity: ≥ 1001 kg but ≤ 1500 kg
Central hot water system (No. 1)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: no external pipework; (b) Piping internal to building: R1.0 (~38 mm) (c) Unit Efficiency: $2.5 < \text{COP} \leq 3.0$
Central cooling system (No. 1)	water source packaged units	Heat rejection method: cooling tower Unit efficiency (min): medium – COP 3.5 – 4.5
Central heating system (No. 1)	water source packaged units + heated water	Energy source: electric heat pump Unit efficiency medium – COP 3.5 – 4.5

2. Commitments for multi-dwelling housing

(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.	✓	✓	✓
(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.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.		✓	✓
(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".		✓	
(iii) Thermal Performance	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.			

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.	✓	✓	✓
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✓		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✓	

3. Commitments for single dwelling houses

(a) Dwellings

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

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.		✓	✓
(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".		✓	
(iii) Thermal Performance	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.			

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.	✓	✓	✓
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✓		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✓	

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 (> 4.5 but <= 6 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): 39 peak kW
Other	Building management system installed?: yes Active power factor correction 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).

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 1742517M

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: Friday, 05 April 2024

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



Project summary

Project name	146 ARTHUR STREET NORTH SYDNEY - Part 2 out of 2
Street address	146 ARTHUR STREET NORTH SYDNEY 2060
Local Government Area	NORTH SYDNEY
Plan type and plan number	Deposited Plan 788579
Lot No.	1
Section no.	-
No. of residential flat buildings	1
Residential flat buildings: no. of dwellings	195
Multi-dwelling housing: no. of dwellings	0
No. of single dwelling houses	0

Project score

Water	✓ 43	Target 40
Thermal Performance	✓ Pass	Target Pass
Energy	✓ 63	Target 63
Materials	✓ -70	Target n/a

Certificate Prepared by

Name / Company Name: INTEGREGO CONSULTING PTY LTD

ABN (if applicable): 42630013008

Description of project

Project address	
Project name	146 ARTHUR STREET NORTH SYDNEY - Part 2 out of 2
Street address	146 ARTHUR STREET NORTH SYDNEY 2060
Local Government Area	NORTH SYDNEY
Plan type and plan number	Deposited Plan 788579
Lot No.	1
Section no.	-
Project type	
No. of residential flat buildings	1
Residential flat buildings: no. of dwellings	195
Multi-dwelling housing: no. of dwellings	0
No. of single dwelling houses	0
Site details	
Site area (m²)	1641
Roof area (m²)	326
Non-residential floor area (m²)	157
Residential car spaces	33
Non-residential car spaces	0

Common area landscape		
Common area lawn (m²)	0	
Common area garden (m²)	350	
Area of indigenous or low water use species (m²)	175	
Assessor details and thermal loads		
Assessor number	DMN/19/1921	
Certificate number	0009344520	
Climate zone	17	
Project score		
Water	 43	Target 40
Thermal Performance	 Pass	Target Pass
Energy	 63	Target 63
Materials	 -70	Target n/a

Description of project

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

Residential flat buildings - Building1, 195 dwellings, 47 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)
2210	1	58	0	0	0
2304	1	50	0	0	0
2308	1	60	0	0	0
2402	2	81	0	0	0
2406	2	81	0	0	0
2410	1	58	0	0	0
2504	1	50	0	0	0
2508	1	60	0	0	0
2602	2	81	0	0	0
2606	2	81	0	0	0
2702	2	81	0	0	0
2706	2	81	0	0	0
2802	2	81	0	0	0
2806	2	81	0	0	0
2902	2	81	0	0	0
2906	2	81	0	0	0
2910	1	58	0	0	0
3004	1	50	0	0	0
3008	1	60	0	0	0
3102	2	81	0	0	0
3106	2	81	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)
2301	2	81	0	0	0
2305	2	81	0	0	0
2309	1	60	0	0	0
2403	1	48	0	0	0
2407	1	58	0	0	0
2501	2	81	0	0	0
2505	2	81	0	0	0
2509	1	60	0	0	0
2603	1	48	0	0	0
2607	2	85	0	0	0
2703	1	48	0	0	0
2707	2	85	0	0	0
2803	1	48	0	0	0
2807	2	85	0	0	0
2903	1	48	0	0	0
2907	1	58	0	0	0
3001	2	81	0	0	0
3005	2	81	0	0	0
3009	1	60	0	0	0
3103	1	48	0	0	0
3107	1	58	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)
2302	2	81	0	0	0
2306	2	81	0	0	0
2310	1	58	0	0	0
2404	1	50	0	0	0
2408	1	60	0	0	0
2502	2	81	0	0	0
2506	2	81	0	0	0
2510	1	58	0	0	0
2604	1	50	0	0	0
2608	2	85	0	0	0
2704	1	50	0	0	0
2708	2	85	0	0	0
2804	1	50	0	0	0
2808	2	85	0	0	0
2904	1	50	0	0	0
2908	1	60	0	0	0
3002	2	81	0	0	0
3006	2	81	0	0	0
3010	1	58	0	0	0
3104	1	50	0	0	0
3108	1	60	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)
2303	1	48	0	0	0
2307	1	58	0	0	0
2401	2	81	0	0	0
2405	2	81	0	0	0
2409	1	60	0	0	0
2503	1	48	0	0	0
2507	1	58	0	0	0
2601	2	81	0	0	0
2605	2	81	0	0	0
2701	2	81	0	0	0
2705	2	81	0	0	0
2801	2	81	0	0	0
2805	2	81	0	0	0
2901	2	81	0	0	0
2905	2	81	0	0	0
2909	1	60	0	0	0
3003	1	48	0	0	0
3007	1	58	0	0	0
3101	2	81	0	0	0
3105	2	81	0	0	0
3109	1	60	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)
3110	1	58	0	0	0
3204	1	50	0	0	0
3208	1	60	0	0	0
3302	2	81	0	0	0
3306	2	81	0	0	0
3310	1	58	0	0	0
3404	1	50	0	0	0
3408	1	60	0	0	0
3502	2	81	0	0	0
3506	2	81	0	0	0
3602	2	81	0	0	0
3606	2	81	0	0	0
3702	2	81	0	0	0
3706	2	81	0	0	0
3802	2	81	0	0	0
3806	2	81	0	0	0
3902	2	81	0	0	0
3906	2	81	0	0	0
4002	2	81	0	0	0
4006	2	81	0	0	0
4102	2	81	0	0	0
4106	2	81	0	0	0
4202	2	81	0	0	0
4206	2	81	0	0	0
4302	2	81	0	0	0
4306	2	81	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)
3201	2	81	0	0	0
3205	2	81	0	0	0
3209	1	60	0	0	0
3303	1	48	0	0	0
3307	1	58	0	0	0
3401	2	81	0	0	0
3405	2	81	0	0	0
3409	1	60	0	0	0
3503	1	48	0	0	0
3507	2	85	0	0	0
3603	1	48	0	0	0
3607	2	85	0	0	0
3703	1	48	0	0	0
3707	2	85	0	0	0
3803	1	48	0	0	0
3807	3	123	0	0	0
3903	1	48	0	0	0
3907	3	123	0	0	0
4003	1	48	0	0	0
4007	3	123	0	0	0
4103	1	48	0	0	0
4107	3	123	0	0	0
4203	1	48	0	0	0
4207	3	123	0	0	0
4303	1	48	0	0	0
4307	3	123	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)
3202	2	81	0	0	0
3206	2	81	0	0	0
3210	1	58	0	0	0
3304	1	50	0	0	0
3308	1	60	0	0	0
3402	2	81	0	0	0
3406	2	81	0	0	0
3410	1	58	0	0	0
3504	1	50	0	0	0
3508	2	85	0	0	0
3604	1	50	0	0	0
3608	2	85	0	0	0
3704	1	50	0	0	0
3708	2	85	0	0	0
3804	1	50	0	0	0
3808	3	123	0	0	0
3904	1	50	0	0	0
3908	3	123	0	0	0
4004	1	50	0	0	0
4008	3	123	0	0	0
4104	1	50	0	0	0
4108	3	123	0	0	0
4204	1	50	0	0	0
4208	3	123	0	0	0
4304	1	50	0	0	0
4308	3	123	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)
3203	1	48	0	0	0
3207	1	58	0	0	0
3301	2	81	0	0	0
3305	2	81	0	0	0
3309	1	60	0	0	0
3403	1	48	0	0	0
3407	1	58	0	0	0
3501	2	81	0	0	0
3505	2	81	0	0	0
3601	2	81	0	0	0
3605	2	81	0	0	0
3701	2	81	0	0	0
3705	2	81	0	0	0
3801	2	81	0	0	0
3805	2	81	0	0	0
3901	2	81	0	0	0
3905	2	81	0	0	0
4001	2	81	0	0	0
4005	2	81	0	0	0
4101	2	81	0	0	0
4105	2	81	0	0	0
4201	2	81	0	0	0
4205	2	81	0	0	0
4301	2	81	0	0	0
4305	2	81	0	0	0
4401	2	81	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
4402	2	81	0	0	0
4406	2	80	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
4403	1	48	0	0	0
4407	3	123	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
4404	1	50	0	0	0
4408	3	123	0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m²)	Unconditioned floor area (m²)	Area of garden & lawn (m²)	Indigenous species (min area m²)
4405	2	82	0	0	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)	Common area	Floor area (m²)	Common area	Floor area (m²)
Lift bank (No. 1)	-	Lift bank (No. 2)	-	Indoor swimming pool and spa area	156
Gym area	47	Undercover car park area	2035	Switch rooms	23
Garbage rooms lower	54	Garbage rooms upper	103	Community 1 - kids play	24
Community 2 - cinema	21	Community 3 - games room	9	Community 4 - lounge circulation	49
Community 5 - residential lounge	70	Community 6 - main lounge	95	Community 7 - flex/community lower	133
Community 8 - co-work lower	35	Community 9 - co work sky bridge	33	Community 10 - community rooms top	80
Community 11 - bookable rooms top	102	Plant or service rooms	149	Plant fan rooms	25
Plant substation	56	Plant circulation areas	82	Plant upper levels	24
Office in main lobby	3	Bike storage	128	Toilets residential	33
Storage and bulky store	116	Ground floor lobbies	113	Hallway/lobby upper levels	1364

Schedule of BASIX commitments

1. Commitments for Residential flat buildings - Building1

(a) Buildings

(i) Materials

(b) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Performance

(c) Common areas and central systems/facilities

(i) Water

(ii) Energy

2. Commitments for multi-dwelling housing

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Performance

3. Commitments for single dwelling houses

(a) Dwellings

(i) Water

(ii) Energy

(iii) Thermal Performance

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

(b) Common areas and central systems/facilities

(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) Buildings

(i) Materials	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) 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 "Floor types", "External wall types", "Internal wall types", "Ceiling and roof types", "Frames" and "Glazing" tables below.			✓
(b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.		✓	
(c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the "Frames" and "Glazing" tables is permitted.	✓	✓	✓
(d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.			✓

Floor types

Floor type	Area (m2)	Insulation	Low emissions option
concrete slab on ground, frame:	745	-	none
suspended floor above garage, frame: suspended concrete slab	1790	foil-foam composite board	none
suspended floor above open subfloor, frame: suspended concrete slab	335	foil-foam composite board	none
floors above habitable rooms, frame: suspended concrete slab	14820	-	none

External wall types

External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 1	concrete panel/ plasterboard, frame: light steel frame	5120	none	rockwool batts, roll or pump-in

External wall types

External wall type	Construction type	Area (m2)	Low emissions option	Insulation
External wall type 2	framed (metal clad),frame:light steel frame	4280	none	rockwool batts, roll or pump-in
External wall type 3	brick veneer,frame:light steel frame	1185	none	rockwool batts, roll or pump-in

Internal wall types

Internal wall type	Construction type	Area (m2)	Insulation
Internal wall type 1	plasterboard, frame:light steel frame	9420	rockwool batts, roll or pump-in
Internal wall type 2	single skin masonry, frame:light steel frame	1230	rockwool batts, roll or pump-in
Internal wall type 3	75 mm AAC panel, frame:light steel frame	12825	rockwool batts, roll or pump-in

Reinforcement concrete frames/columns

Building has reinforced concrete frame/columns?	Volume (m³)	Low emissions option
yes	2540	-

Ceiling and roof types

Ceiling and roof type	Area (m²)	Roof Insulation	Ceiling Insulation
concrete - plasterboard internal, frame: light steel frame	681	-	foil-foam composite board

Glazing types

Frame types

Single glazing (m²)	Double glazing (m²)	Triple glazing (m²)	Aluminium frames (m²)	Timber frames (m²)	uPVC frames (m²)	Steel frames (m²)	Composite frames (m²)
0	5415	0	5415	0	0	0	0

(b) 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 (> 4.5 but <= 6 L/min)	4 star	5 star	5 star	-	not specified	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
All dwellings	No alternative water supply	-	-	-	-	-	-	-
All dwellings	No alternative water supply	-	-	-	-	-	-	-

(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.		✓	✓
(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:			

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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 (No. 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

	Cooling		Heating		Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bathrooms or toilets	Main kitchen
2302, 2305, 2402, 2405, 2502, 2505, 2602, 2605, 2702, 2705, 2802, 2805, 2902, 2905, 3002, 3005, 3102, 3105, 3202, 3205, 3302, 3305, 3402, 3405, 3502, 3505, 3602, 3605, 3702, 3705, 3802, 3805, 3902, 3905, 4002, 4005, 4102, 4105, 4202, 4205, 4302, 4305, 4402, 4405	Central cooling system (No. 1)	Central cooling system (No. 1)	Central heating system (No. 1)	Central heating system (No. 1)	0	yes
All other dwellings	Central cooling system (No. 1)	Central cooling system (No. 1)	Central heating system (No. 1)	Central heating system (No. 1)	0	no

	Individual pool			Individual spa		Appliances other efficiency measures				
Dwelling no.	Pool heating system	Pool Pump	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Dishwasher	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	-	induction cooktop & electric oven	4 star	8.0 star	no	no

(iii) Thermal Performance	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.	✓	✓	✓
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✓		

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.			

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m²/yr)	Area adjusted cooling load (in MJ/m²/yr)	Area adjusted total load (in MJ/m²/yr)
2210	7.50	8.70	16.200
2301	24.40	4.90	29.300
2302	13.00	3.60	16.600
2303	2.40	9.60	12.000
2307	7.90	10.60	18.500
2308	8.00	6.80	14.800
2310	7.20	9.20	16.400
2401	24.40	4.70	29.100
2402	13.10	3.60	16.700
2403	2.40	9.50	11.900
2407	7.90	10.50	18.400
2408	8.00	6.90	14.900
2410	7.20	9.40	16.600
2502	13.90	3.40	17.300
2503	2.70	9.40	12.100
2504	2.60	7.90	10.500
2505	6.30	6.70	13.000
2507	8.40	9.60	18.000
2508	16.90	8.10	25.000
2509	17.50	8.00	25.500
2510	7.60	8.40	16.000
2602	13.20	3.70	16.900
2603	2.50	9.30	11.800
2605	6.10	7.00	13.100
2607	13.50	9.00	22.500
2608	14.50	7.40	21.900

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
2701	24.00	5.00	29.000
2702	13.30	3.60	16.900
2703	2.60	9.30	11.900
2705	6.20	7.00	13.200
2707	13.60	9.00	22.600
2801	24.20	5.00	29.200
2802	14.10	3.40	17.500
2803	2.80	9.00	11.800
2804	2.70	7.60	10.300
2805	6.50	6.70	13.200
2807	14.20	8.20	22.400
2901	24.90	4.80	29.700
2902	13.40	3.60	17.000
2904	2.50	8.10	10.600
2905	6.30	7.00	13.300
2906	5.500	7.40	12.900
2907	8.20	10.10	18.300
2908	19.40	4.70	24.100
2909	20.10	4.60	24.700
2910	7.50	8.60	16.100
3001	25.00	4.80	29.800
3002	13.50	3.70	17.200
3004	2.50	8.00	10.500
3007	8.30	9.70	18.000
3008	8.50	6.40	14.900
3009	9.10	6.10	15.200
3010	7.60	8.50	16.100
3101	24.30	5.00	29.300
3102	14.30	3.40	17.700
3103	2.90	8.70	11.600
3104	2.80	7.30	10.100

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
3105	6.60	6.70	13.300
3107	8.70	9.00	17.700
3108	8.90	5.90	14.800
3109	9.40	5.80	15.200
3110	8.00	7.70	15.700
3201	25.10	4.90	30.000
3202	13.60	3.60	17.200
3203	2.70	8.80	11.500
3204	2.60	7.80	10.400
3208	8.60	6.30	14.900
3209	9.20	6.00	15.200
3210	7.70	8.40	16.100
3301	25.10	4.80	29.900
3302	13.70	3.60	17.300
3303	2.70	8.70	11.400
3308	8.60	6.10	14.700
3309	9.20	6.10	15.300
3310	7.70	8.30	16.000
3401	24.60	4.90	29.500
3402	14.50	3.40	17.900
3403	3.00	8.50	11.500
3405	6.80	6.60	13.400
3407	8.90	8.80	17.700
3408	17.50	7.60	25.100
3409	18.20	7.50	25.700
3410	8.20	7.60	15.800
3501	24.50	5.00	29.500
3502	13.80	3.60	17.400
3506	5.800	7.30	13.100
3507	14.00	8.40	22.400
3508	15.00	6.80	21.800

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
3601	24.60	5.00	29.600
3602	13.90	3.60	17.500
3604	2.700	7.60	10.300
3605	6.50	6.80	13.300
3607	14.10	8.30	22.400
3608	15.10	6.80	21.900
3702	14.60	3.30	17.900
3703	3.10	8.10	11.200
3704	3.10	7.10	10.200
3705	6.90	6.60	13.500
3706	5.90	7.20	13.100
3707	14.80	7.50	22.300
3708	15.70	6.30	22.000
3801	25.50	4.80	30.300
3802	14.00	3.60	17.600
3804	2.80	7.60	10.400
3805	6.60	6.90	13.500
3807	12.40	7.10	19.500
3808	13.60	4.90	18.500
3901	25.60	4.90	30.500
3902	14.00	3.50	17.500
3903	2.90	8.50	11.400
3904	2.80	7.50	10.300
3905	6.70	6.90	13.600
3907	9.50	7.80	17.300
4002	14.80	3.50	18.300
4003	3.20	8.00	11.200
4004	3.10	7.00	10.100
4005	7.00	6.50	13.500
4006	6.000	7.10	13.100
4007	10.00	7.10	17.100

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
4008	11.10	4.80	15.900
4102	23.10	5.60	28.700
4107	9.60	7.70	17.300
4108	10.50	5.20	15.700
4205	6.800	6.70	13.500
4206	6.000	7.20	13.200
4207	9.70	7.60	17.300
4301	27.90	5.30	33.200
4303	3.00	8.30	11.300
4307	9.70	7.50	17.200
4308	10.60	5.20	15.800
4401	32.50	4.40	36.900
4402	23.40	5.40	28.800
4403	3.10	8.40	11.500
4404	2.90	7.10	10.000
4406	11.20	7.80	19.000
4407	20.90	8.60	29.500
4408	22.30	6.10	28.400
2304, 2404	2.30	8.50	10.800
2305, 2405	5.90	7.00	12.900
2306, 2506	5.30	7.40	12.700
2309, 2409	8.60	6.70	15.300
2501, 2601	23.90	5.00	28.900
2604, 2704	2.40	8.30	10.700
2708, 2808	14.60	7.30	21.900
2903, 3003	2.60	9.00	11.600
3005, 3205	6.40	6.90	13.300
3106, 3306	5.70	7.30	13.000
3207, 3307	8.40	9.50	17.900
3304, 3504	2.70	7.70	10.400
3305, 3505	6.50	6.90	13.400

	Thermal loads		
Dwelling no.	Area adjusted heating load (in MJ/m ² /yr)	Area adjusted cooling load (in MJ/m ² /yr)	Area adjusted total load (in MJ/m ² /yr)
3404, 4304	2.90	7.20	10.100
3406, 3606	5.80	7.30	13.100
3701, 4001	24.90	5.00	29.900
3806, 3906	5.90	7.30	13.200
3908, 4208	10.60	5.30	15.900
4101, 4201	27.80	5.40	33.200
4103, 4203	3.00	8.40	11.400
4104, 4204	2.90	7.40	10.300
4106, 4306	6.00	7.20	13.200
4202, 4302	23.20	5.60	28.800
2406, 2606, 2706	5.40	7.40	12.800
2806, 3006, 3206	5.60	7.40	13.000
3503, 3603, 3803	2.80	8.50	11.300
All other dwellings	6.80	6.70	13.500

(c) 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 (> 4.5 but <= 6 L/min)	4 star	5 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Swimming pool (No. 1)	Volume: 47.5 kLs	Location: Indoor swimming pool and/or spa area (No. 1)	-
Spa (No. 2)	Volume: 7 kLs	Location: Indoor swimming pool and/or spa area (No. 1) Spa cover: yes	-
Central water tank - rainwater or stormwater (No. 1)	10000	To collect run-off from at least: - 200 square metres of roof area of buildings in the development - 0 square metres of impervious area in the development - 0 square metres of garden/lawn area in the development - 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 350 square metres of common landscaped area on the site - car washing in 1 car washing bays on the site
Fire sprinkler system (No. 1)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-

Central systems	Size	Configuration	Connection (to allow for...)
Fire sprinkler system (No. 2)	-	So that fire sprinkler test water is contained within the fire sprinkler system for re-use, rather than disposed.	-
Central cooling system (No. 1)	-	Private water meter on make-up line connected to building management system. Conductivity controller installed in the cooling tower.	-

(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
Lift bank (No. 1)	-	-	light-emitting diode	connected to lift call button	yes
Lift bank (No. 2)	-	-	light-emitting diode	connected to lift call button	yes
Indoor swimming pool and spa area	tempered supply air only	time clock or BMS controlled	light-emitting diode	daylight sensors	yes
Gym area	air conditioning system	time clock or BMS controlled	light-emitting diode	daylight sensors	yes
Undercover car park area	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	light-emitting diode	zoned switching with motion sensor	yes
Switch rooms	ventilation exhaust only	thermostatically controlled	light-emitting diode	motion sensors	yes
Garbage rooms lower	ventilation exhaust only	-	light-emitting diode	motion sensors	yes
Garbage rooms upper	ventilation exhaust only	-	light-emitting diode	motion sensors	yes
Community 1 - kids play	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Community 2 - cinema	air conditioning system	time clock or BMS controlled	light-emitting diode	manual on / manual off	yes
Community 3 - games room	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Community 4 - lounge circulation	air conditioning system	time clock or BMS controlled	light-emitting diode	motion sensors	yes

	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
Community 5 - residential lounge	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 6 - main lounge	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 7 - flex/ community lower	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 8 - co-work lower	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 9 - co work sky bridge	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 10 - community rooms top	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Community 11 - bookable rooms top	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Plant or service rooms	ventilation exhaust only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Plant fan rooms	no mechanical ventilation	-	light-emitting diode	motion sensors	yes
Plant substation	ventilation exhaust only	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Plant circulation areas	ventilation supply only	none i.e., continuous	light-emitting diode	motion sensors	yes
Plant upper levels	ventilation supply only	time clock or BMS controlled	light-emitting diode	motion sensors	yes
Office in main lobby	air conditioning system	time clock or BMS controlled	light-emitting diode	manual on / manual off	yes
Bike storage	ventilation supply only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Toilets residential	ventilation exhaust only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Storage and bulky store	ventilation supply only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Ground floor lobbies	air conditioning system	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes
Hallway/lobby upper levels	tempered supply air only	time clock or BMS controlled	light-emitting diode	zoned switching with motion sensor	yes

Central energy systems	Type	Specification
Swimming pool (No. 1)	Heating source: electric heat pump	Pump controlled by timer: yes
Spa (No. 2)	Heating system: electric heat pump	Pump controlled by timer: yes
Sauna (No. 1)	Heating source: electric infrared	Efficiency measure: manual on / timer off
Lift bank (No. 1)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 43 number of levels from the bottom of the lift shaft to the top of the lift shaft: 51 number of lifts: 2 lift load capacity: ≥ 1001 kg but ≤ 1500 kg
Lift bank (No. 2)	gearless traction with V V V F motor and regenerative drive	Number of levels (including basement): 22 number of levels from the bottom of the lift shaft to the top of the lift shaft: 24 number of lifts: 1 lift load capacity: ≥ 1001 kg but ≤ 1500 kg
Central hot water system (No. 1)	electric heat pump – air sourced	Piping insulation (ringmain & supply risers): (a) Piping external to building: no external pipework; (b) Piping internal to building: R1.0 (~38 mm) (c) Unit Efficiency: $2.5 < \text{COP} \leq 3.0$
Central cooling system (No. 1)	water source packaged units	Heat rejection method: cooling tower Unit efficiency (min): medium – COP 3.5 – 4.5
Central heating system (No. 1)	water source packaged units + heated water	Energy source: electric heat pump Unit efficiency medium – COP 3.5 – 4.5

2. Commitments for multi-dwelling housing

(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.	✓	✓	✓
(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.		✓	✓

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.		✓	✓
(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".		✓	
(iii) Thermal Performance	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.			

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.	✓	✓	✓
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✓		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✓	

3. Commitments for single dwelling houses

(a) Dwellings

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

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.			
(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".			
(iii) Thermal Performance	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.			

(iii) Thermal Performance	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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.	✓	✓	✓
(i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.	✓		
(j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate.		✓	

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 (> 4.5 but <= 6 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): 39 peak kW
Other	Building management system installed?: yes Active power factor correction 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).

Nationwide House Energy Rating Scheme®

Class 2 Summary

NatHERS® Certificate No. 0009344520

Generated on 01 Apr 2024 using BERS Pro v5.1.7 (3.22)

Property

Address 146 Arthur Street,
North Sydney , NSW , 2060

Lot/DP Lot 1 DP 788579

NatHERS Climate Zone 17 Sydney RO (Observatory Hill)



Accredited assessor

Name Martin Pinson

Business name INTEGRECO

Email consulting@integreco.com

Phone 0422144603

Accreditation No. DMN/19/1921

Assessor Accrediting Organisation
Design Matters National

Verification

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



National Construction Code (NCC) requirements

The NCC allows the use of NatHERS accredited software to comply with the energy efficiency requirements for houses (Class 1 buildings) and apartments (Class 2 sole-occupancy units and Class 4 parts of buildings). The applicable requirements for houses are detailed in Specification 42 of NCC Volume Two. For apartments the requirements are detailed in clauses J3D3 and J3D15 of NCC Volume One.

NCC 2022 includes enhanced thermal performance requirements for houses and apartments. It also includes a new whole-of-home annual energy use budget which applies to the major equipment in the home.

The NCC, and associated ABCB Standards and support material, can be accessed at www.abcb.gov.au.

Note, variations and additions to the NCC energy efficiency requirements may apply in some states and territories.

Summary of all dwellings

Certificate number and link	Unit Number	Heating load (load limit) [MJ/m ² /p.a.]	Cooling load (load limit) [MJ/m ² /p.a.]	Total load [MJ/m ² /p.a.]	Star Rating	Whole of Home Rating
0009343294-01	0201	33.0 (N/A)	4.3 (N/A)	37.3	6.2	0
0009342858-01	0202	29.2 (N/A)	4.4 (N/A)	33.6	6.6	0

Thermal performance Star rating



**NATIONWIDE
HOUSE**
ENERGY RATING SCHEME®

The rating above is the average of all dwellings in this summary.

For more information on your dwelling's rating see:
www.nathers.gov.au

NCC heating and cooling maximum loads (MJ/m²/p.a.)

Limits taken from ABCB Standard 2022

	Heating	Cooling
Modelled block average	9.9	8
Maximum block limit	N/A	N/A

Whole of Home performance rating

No Whole of Home performance rating conducted for this summary certificate or not completed for all dwellings



Summary of all dwellings (continued)

Certificate number and link	Unit Number	Heating load (load limit) [MJ/m ² /p.a.]	Cooling load (load limit) [MJ/m ² /p.a.]	Total load [MJ/m ² /p.a.]	Star Rating	Whole of Home Rating
0009344656-01	0203	3.3 (N/A)	17.3 (N/A)	20.7	8.2	0
0009344979-01	0204	14.8 (N/A)	11.1 (N/A)	25.9	7.5	0
0009345562-01	0205	8.8 (N/A)	7.9 (N/A)	16.6	8.7	0
0009345919-01	0206	5.2 (N/A)	6.7 (N/A)	11.9	9.3	0
0009343302-01	0207	13.4 (N/A)	13.7 (N/A)	27.2	7.4	0
0009346339-01	0208	6.5 (N/A)	5.1 (N/A)	11.6	9.3	0
0009343278-01	0209	8.3 (N/A)	11.6 (N/A)	19.8	8.3	0
0009343328-01	0301	21.5 (N/A)	4.5 (N/A)	26.0	7.5	0
0009342882-01	0302	16.8 (N/A)	5.7 (N/A)	22.5	7.9	0
0009344680-01	0303	3.6 (N/A)	17.1 (N/A)	20.7	8.2	0
0009344946-01	0304	3.9 (N/A)	15.9 (N/A)	19.8	8.3	0
0009345661-01	0305	5.2 (N/A)	8.8 (N/A)	14.0	9	0
0009345935-01	0306	2.8 (N/A)	8.3 (N/A)	11.1	9.4	0
0009344185-01	0307	4.5 (N/A)	17.6 (N/A)	22.0	8	0
0009343484-01	0308	4.3 (N/A)	11.9 (N/A)	16.2	8.7	0
0009344268-01	0309	4.8 (N/A)	11.6 (N/A)	16.4	8.7	0
0009343229-01	0310	3.9 (N/A)	16.0 (N/A)	20.0	8.3	0
0009343419-01	0401	22.1 (N/A)	4.4 (N/A)	26.6	7.4	0
0009342593-01	0402	17.2 (N/A)	5.3 (N/A)	22.5	7.9	0
0009344920-01	0403	3.9 (N/A)	17.3 (N/A)	21.2	8.1	0
0009345034-01	0404	4.2 (N/A)	15.5 (N/A)	19.7	8.3	0
0009345638-01	0405	5.6 (N/A)	8.7 (N/A)	14.2	8.9	0
0009346248-01	0406	2.9 (N/A)	8.2 (N/A)	11.1	9.4	0
0009344219-01	0407	5.1 (N/A)	16.0 (N/A)	21.0	8.1	0
0009344052-01	0408	4.9 (N/A)	10.9 (N/A)	15.8	8.8	0
0009342981-01	0409	5.3 (N/A)	10.6 (N/A)	16.0	8.8	0
0009343252-01	0410	4.4 (N/A)	14.6 (N/A)	19.1	8.4	0
0009343351-01	0501	22.1 (N/A)	4.4 (N/A)	26.5	7.4	0
0009342353-01	0502	17.5 (N/A)	5.1 (N/A)	22.6	7.9	0
0009344714-01	0503	4.1 (N/A)	16.6 (N/A)	20.8	8.2	0
0009344912-01	0504	4.4 (N/A)	15.4 (N/A)	19.8	8.3	0
0009345729-01	0505	5.8 (N/A)	8.2 (N/A)	14.0	9	0
0009345968-01	0506	3.1 (N/A)	8.0 (N/A)	11.1	9.4	0
0009344151-01	0507	4.9 (N/A)	16.6 (N/A)	21.5	8.1	0



<u>0009343500-01</u>	0508	4.8 (N/A)	11.3 (N/A)	16.1	8.7	0
<u>0009344292-01</u>	0509	5.3 (N/A)	11.1 (N/A)	16.3	8.7	0
<u>0009343195-01</u>	0510	4.3 (N/A)	15.4 (N/A)	19.7	8.3	0
<u>0009343385-01</u>	0601	22.5 (N/A)	4.5 (N/A)	27.0	7.4	0
<u>0009342387-01</u>	0602	17.8 (N/A)	4.8 (N/A)	22.6	7.9	0
<u>0009344748-01</u>	0603	4.4 (N/A)	16.5 (N/A)	20.9	8.1	0
<u>0009344870-01</u>	0604	4.7 (N/A)	15.4 (N/A)	20.0	8.3	0
<u>0009345695-01</u>	0605	5.9 (N/A)	7.8 (N/A)	13.7	9	0
<u>0009345992-01</u>	0606	3.2 (N/A)	7.8 (N/A)	11.0	9.4	0
<u>0009344128-01</u>	0607	5.2 (N/A)	16.5 (N/A)	21.6	8.1	0
<u>0009343534-01</u>	0608	5.0 (N/A)	10.9 (N/A)	16.0	8.8	0
<u>0009344326-01</u>	0609	5.5 (N/A)	10.8 (N/A)	16.4	8.7	0
<u>0009343161-01</u>	0610	4.5 (N/A)	14.9 (N/A)	19.5	8.3	0
<u>0009343443-01</u>	0701	23.0 (N/A)	4.5 (N/A)	27.5	7.3	0
<u>0009342627-01</u>	0702	18.2 (N/A)	4.9 (N/A)	23.0	7.9	0
<u>0009344953-01</u>	0703	4.6 (N/A)	16.5 (N/A)	21.1	8.1	0
<u>0009345000-01</u>	0704	4.9 (N/A)	15.1 (N/A)	20.0	8.3	0
<u>0009345604-01</u>	0705	6.2 (N/A)	7.9 (N/A)	14.0	9	0
<u>0009346271-01</u>	0706	3.4 (N/A)	8.1 (N/A)	11.5	9.3	0
<u>0009344243-01</u>	0707	5.7 (N/A)	15.2 (N/A)	20.9	8.1	0
<u>0009343930-01</u>	0708	13.3 (N/A)	13.0 (N/A)	26.2	7.4	0
<u>0009343153-01</u>	0709	13.9 (N/A)	12.8 (N/A)	26.7	7.4	0
<u>0009343286-01</u>	0710	5.0 (N/A)	13.6 (N/A)	18.6	8.4	0
<u>0009343112-01</u>	0801	24.6 (N/A)	4.6 (N/A)	29.2	7.1	0
<u>0009342411-01</u>	0802	18.2 (N/A)	4.7 (N/A)	22.9	7.9	0
<u>0009344771-01</u>	0803	4.7 (N/A)	16.1 (N/A)	20.8	8.2	0
<u>0009344847-01</u>	0804	5.0 (N/A)	15.3 (N/A)	20.3	8.2	0
<u>0009345752-01</u>	0805	6.2 (N/A)	10.5 (N/A)	16.7	8.7	0
<u>0009346024-01</u>	0806	3.5 (N/A)	7.7 (N/A)	11.3	9.3	0
<u>0009343336-01</u>	0807	11.7 (N/A)	11.2 (N/A)	23.0	7.9	0
<u>0009343708-01</u>	0808	12.6 (N/A)	9.3 (N/A)	21.9	8	0
<u>0009343146-01</u>	0901	24.5 (N/A)	4.8 (N/A)	29.3	7.1	0
<u>0009342445-01</u>	0902	18.2 (N/A)	4.8 (N/A)	23.0	7.9	0
<u>0009344805-01</u>	0903	4.9 (N/A)	15.9 (N/A)	20.8	8.2	0
<u>0009345422-01</u>	0904	5.0 (N/A)	15.9 (N/A)	20.9	8.1	0
<u>0009345786-01</u>	0905	6.2 (N/A)	10.7 (N/A)	16.9	8.6	0
<u>0009346057-01</u>	0906	4.3 (N/A)	7.0 (N/A)	11.3	9.3	0
<u>0009343369-01</u>	0907	11.9 (N/A)	10.9 (N/A)	22.9	7.9	0



<u>0009343740-01</u>	0908	12.8 (N/A)	9.1 (N/A)	21.9	8	0
<u>0009343179-01</u>	1001	25.0 (N/A)	4.6 (N/A)	29.6	7.1	0
<u>0009342569-01</u>	1002	18.3 (N/A)	4.6 (N/A)	22.8	7.9	0
<u>0009344987-01</u>	1003	4.6 (N/A)	17.2 (N/A)	21.8	8	0
<u>0009345067-01</u>	1004	4.9 (N/A)	15.8 (N/A)	20.7	8.2	0
<u>0009345513-01</u>	1005	6.2 (N/A)	10.5 (N/A)	16.7	8.7	0
<u>0009346180-01</u>	1006	4.4 (N/A)	6.9 (N/A)	11.3	9.3	0
<u>0009343401-01</u>	1007	12.6 (N/A)	9.9 (N/A)	22.5	7.9	0
<u>0009343773-01</u>	1008	13.4 (N/A)	8.4 (N/A)	21.8	8	0
<u>0009342874-01</u>	1101	24.5 (N/A)	4.8 (N/A)	29.3	7.1	0
<u>0009342478-01</u>	1102	17.6 (N/A)	5.4 (N/A)	23.1	7.9	0
<u>0009344854-01</u>	1103	4.6 (N/A)	16.9 (N/A)	21.5	8.1	0
<u>0009345398-01</u>	1104	4.3 (N/A)	17.5 (N/A)	21.8	8	0
<u>0009345810-01</u>	1105	6.1 (N/A)	11.0 (N/A)	17.0	8.6	0
<u>0009346081-01</u>	1106	4.4 (N/A)	6.9 (N/A)	11.3	9.3	0
<u>0009344094-01</u>	1107	6.9 (N/A)	12.3 (N/A)	19.2	8.4	0
<u>0009343906-01</u>	1108	17.6 (N/A)	5.9 (N/A)	23.5	7.8	0
<u>0009344235-01</u>	1109	18.3 (N/A)	6.0 (N/A)	24.3	7.7	0
<u>0009343138-01</u>	1110	6.2 (N/A)	10.9 (N/A)	17.1	8.6	0
<u>0009342841-01</u>	1201	24.4 (N/A)	4.9 (N/A)	29.2	7.1	0
<u>0009342502-02</u>	1202	21.6 (N/A)	3.1 (N/A)	24.7	7.7	0
<u>0009344862-01</u>	1203	4.2 (N/A)	18.8 (N/A)	23.0	7.9	0
<u>0009345364-01</u>	1204	4.3 (N/A)	18.6 (N/A)	22.9	7.9	0
<u>0009345844-01</u>	1205	5.7 (N/A)	11.7 (N/A)	17.4	8.6	0
<u>0009346115-01</u>	1206	4.6 (N/A)	6.9 (N/A)	11.5	9.3	0
<u>0009344060-01</u>	1207	7.0 (N/A)	12.3 (N/A)	19.2	8.4	0
<u>0009343567-01</u>	1208	7.0 (N/A)	8.1 (N/A)	15.1	8.9	0
<u>0009344359-01</u>	1209	7.5 (N/A)	8.0 (N/A)	15.5	8.8	0
<u>0009343104-01</u>	1210	6.3 (N/A)	10.7 (N/A)	16.9	8.6	0
<u>0009343476-01</u>	1301	22.6 (N/A)	5.0 (N/A)	27.5	7.3	0
<u>0009342650-02</u>	1302	19.7 (N/A)	3.0 (N/A)	22.7	7.9	0
<u>0009344896-01</u>	1303	5.9 (N/A)	7.3 (N/A)	13.1	9.1	0
<u>0009345091-01</u>	1304	5.1 (N/A)	7.0 (N/A)	12.1	9.2	0
<u>0009345463-01</u>	1305	9.0 (N/A)	6.0 (N/A)	15.1	8.9	0
<u>0009346156-01</u>	1306	4.7 (N/A)	7.2 (N/A)	11.9	9.3	0
<u>0009344276-01</u>	1307	7.4 (N/A)	11.3 (N/A)	18.7	8.4	0
<u>0009344144-01</u>	1308	7.4 (N/A)	7.4 (N/A)	14.8	8.9	0
<u>0009343005-01</u>	1309	7.9 (N/A)	7.3 (N/A)	15.2	8.9	0



<u>0009343310-01</u>	1310	6.7 (N/A)	9.7 (N/A)	16.4	8.7	0
<u>0009342817-01</u>	1401	23.5 (N/A)	4.8 (N/A)	28.3	7.2	0
<u>0009342825-01</u>	1402	10.2 (N/A)	8.7 (N/A)	18.9	8.4	0
<u>0009344623-01</u>	1403	3.9 (N/A)	8.9 (N/A)	12.8	9.2	0
<u>0009345349-01</u>	1404	3.2 (N/A)	8.7 (N/A)	11.9	9.3	0
<u>0009345885-01</u>	1405	6.9 (N/A)	6.7 (N/A)	13.6	9.1	0
<u>0009346149-01</u>	1406	4.7 (N/A)	6.9 (N/A)	11.6	9.3	0
<u>0009344037-01</u>	1407	7.2 (N/A)	12.0 (N/A)	19.2	8.4	0
<u>0009343591-01</u>	1408	7.3 (N/A)	7.9 (N/A)	15.1	8.9	0
<u>0009344375-01</u>	1409	7.8 (N/A)	7.6 (N/A)	15.4	8.8	0
<u>0009343070-01</u>	1410	6.5 (N/A)	10.1 (N/A)	16.6	8.7	0
<u>0009342783-01</u>	1501	23.6 (N/A)	4.8 (N/A)	28.4	7.2	0
<u>0009342536-01</u>	1502	12.5 (N/A)	3.7 (N/A)	16.2	8.7	0
<u>0009344615-01</u>	1503	2.1 (N/A)	10.6 (N/A)	12.8	9.2	0
<u>0009345323-01</u>	1504	1.9 (N/A)	9.6 (N/A)	11.6	9.3	0
<u>0009345869-01</u>	1505	5.5 (N/A)	7.1 (N/A)	12.5	9.2	0
<u>0009346172-01</u>	1506	4.8 (N/A)	6.8 (N/A)	11.6	9.3	0
<u>0009344003-01</u>	1507	7.3 (N/A)	11.8 (N/A)	19.1	8.4	0
<u>0009343625-01</u>	1508	7.3 (N/A)	7.7 (N/A)	15.0	8.9	0
<u>0009344417-01</u>	1509	7.9 (N/A)	7.5 (N/A)	15.4	8.8	0
<u>0009343054-01</u>	1510	6.6 (N/A)	10.2 (N/A)	16.8	8.7	0
<u>0009343518-01</u>	1601	23.0 (N/A)	5.1 (N/A)	28.1	7.2	0
<u>0009342684-01</u>	1602	13.0 (N/A)	3.6 (N/A)	16.6	8.7	0
<u>0009345018-01</u>	1603	2.3 (N/A)	10.2 (N/A)	12.5	9.2	0
<u>0009345125-01</u>	1604	2.2 (N/A)	8.9 (N/A)	11.1	9.4	0
<u>0009345539-01</u>	1605	5.7 (N/A)	6.8 (N/A)	12.5	9.2	0
<u>0009346214-01</u>	1606	4.9 (N/A)	7.1 (N/A)	12.0	9.3	0
<u>0009344300-01</u>	1607	7.8 (N/A)	10.8 (N/A)	18.6	8.4	0
<u>0009343963-01</u>	1608	16.1 (N/A)	8.9 (N/A)	25.0	7.6	0
<u>0009343187-01</u>	1609	16.7 (N/A)	8.7 (N/A)	25.4	7.6	0
<u>0009343344-01</u>	1610	7.0 (N/A)	9.3 (N/A)	16.3	8.7	0
<u>0009343088-01</u>	1701	23.1 (N/A)	5.1 (N/A)	28.2	7.2	0
<u>0009342791-01</u>	1702	12.5 (N/A)	3.6 (N/A)	16.1	8.7	0
<u>0009344813-01</u>	1703	2.1 (N/A)	10.5 (N/A)	12.6	9.2	0
<u>0009345299-01</u>	1704	2.0 (N/A)	9.4 (N/A)	11.4	9.3	0
<u>0009345471-01</u>	1705	5.5 (N/A)	7.0 (N/A)	12.5	9.2	0
<u>0009346206-01</u>	1706	4.9 (N/A)	7.2 (N/A)	12.1	9.2	0
<u>0009343435-01</u>	1707	12.9 (N/A)	9.9 (N/A)	22.8	7.9	0



<u>0009343799-01</u>	1708	13.8 (N/A)	8.3 (N/A)	22.2	7.9	0
<u>0009343047-01</u>	1801	23.2 (N/A)	5.1 (N/A)	28.3	7.2	0
<u>0009342767-01</u>	1802	12.6 (N/A)	3.7 (N/A)	16.2	8.7	0
<u>0009344789-01</u>	1803	2.2 (N/A)	10.3 (N/A)	12.5	9.2	0
<u>0009345265-01</u>	1804	2.1 (N/A)	9.3 (N/A)	11.4	9.3	0
<u>0009345497-01</u>	1805	5.6 (N/A)	7.0 (N/A)	12.6	9.2	0
<u>0009346230-01</u>	1806	5.0 (N/A)	7.2 (N/A)	12.2	9.2	0
<u>0009343468-01</u>	1807	13.0 (N/A)	9.7 (N/A)	22.7	7.9	0
<u>0009343823-01</u>	1808	13.9 (N/A)	8.3 (N/A)	22.2	7.9	0
<u>0009343203-01</u>	1901	23.4 (N/A)	5.0 (N/A)	28.5	7.2	0
<u>0009342718-01</u>	1902	13.3 (N/A)	3.5 (N/A)	16.8	8.7	0
<u>0009344755-01</u>	1903	2.2 (N/A)	10.2 (N/A)	12.4	9.2	0
<u>0009345158-01</u>	1904	2.4 (N/A)	8.3 (N/A)	10.6	9.4	0
<u>0009345570-01</u>	1905	5.9 (N/A)	6.8 (N/A)	12.7	9.2	0
<u>0009346123-01</u>	1906	5.1 (N/A)	7.3 (N/A)	12.4	9.2	0
<u>0009343492-01</u>	1907	13.5 (N/A)	9.0 (N/A)	22.5	7.9	0
<u>0009343856-01</u>	1908	14.4 (N/A)	7.4 (N/A)	21.8	8	0
<u>0009342759-01</u>	2001	24.1 (N/A)	4.7 (N/A)	28.8	7.2	0
<u>0009342734-01</u>	2002	12.8 (N/A)	3.7 (N/A)	16.4	8.7	0
<u>0009345232-01</u>	2003	2.2 (N/A)	9.3 (N/A)	11.4	9.3	0
<u>0009345521-01</u>	2004	5.7 (N/A)	6.9 (N/A)	12.7	9.2	0
<u>0009346263-01</u>	2005	5.1 (N/A)	7.2 (N/A)	12.3	9.2	0
<u>0009343971-01</u>	2006	7.6 (N/A)	11.1 (N/A)	18.8	8.4	0
<u>0009343872-01</u>	2007	18.6 (N/A)	5.1 (N/A)	23.8	7.8	0
<u>0009344201-01</u>	2008	19.3 (N/A)	5.0 (N/A)	24.4	7.7	0
<u>0009343021-01</u>	2009	6.9 (N/A)	9.5 (N/A)	16.4	8.7	0
<u>0009342726-01</u>	2101	24.2 (N/A)	4.9 (N/A)	29.1	7.1	0
<u>0009342700-01</u>	2102	12.9 (N/A)	3.7 (N/A)	16.5	8.7	0
<u>0009344722-01</u>	2103	2.3 (N/A)	9.8 (N/A)	12.1	9.2	0
<u>0009345208-01</u>	2104	2.2 (N/A)	9.2 (N/A)	11.4	9.3	0
<u>0009345554-01</u>	2105	5.8 (N/A)	6.9 (N/A)	12.7	9.2	0
<u>0009346297-01</u>	2106	5.2 (N/A)	7.4 (N/A)	12.6	9.2	0
<u>0009343948-01</u>	2107	7.7 (N/A)	10.8 (N/A)	18.6	8.4	0
<u>0009343658-01</u>	2108	7.8 (N/A)	7.1 (N/A)	14.9	8.9	0
<u>0009344441-01</u>	2109	8.4 (N/A)	6.9 (N/A)	15.3	8.8	0
<u>0009342999-01</u>	2110	7.0 (N/A)	9.5 (N/A)	16.5	8.7	0
<u>0009346347-01</u>	2201	24.3 (N/A)	4.8 (N/A)	29.1	7.1	0
<u>0009342742-01</u>	2202	13.6 (N/A)	3.5 (N/A)	17.0	8.6	0



<u>0009345042-01</u>	2203	2.6 (N/A)	9.5 (N/A)	12.1	9.2	0
<u>0009345182-01</u>	2204	2.5 (N/A)	8.1 (N/A)	10.6	9.4	0
<u>0009345596-01</u>	2205	6.2 (N/A)	6.8 (N/A)	13.0	9.1	0
<u>0009346099-01</u>	2206	5.3 (N/A)	7.4 (N/A)	12.7	9.2	0
<u>0009344334-01</u>	2207	8.2 (N/A)	10.1 (N/A)	18.3	8.4	0
<u>0009344110-01</u>	2208	8.3 (N/A)	6.6 (N/A)	14.9	8.9	0
<u>0009343039-01</u>	2209	8.8 (N/A)	6.5 (N/A)	15.2	8.9	0
<u>0009343377-01</u>	2210	7.5 (N/A)	8.7 (N/A)	16.2	8.7	0
<u>0009342692-01</u>	2301	24.4 (N/A)	4.9 (N/A)	29.3	7.1	0
<u>0009342676-01</u>	2302	13.0 (N/A)	3.6 (N/A)	16.6	8.7	0
<u>0009344698-01</u>	2303	2.4 (N/A)	9.6 (N/A)	12.0	9.3	0
<u>0009345174-01</u>	2304	2.3 (N/A)	8.5 (N/A)	10.8	9.4	0
<u>0009345588-01</u>	2305	5.9 (N/A)	7.0 (N/A)	13.0	9.1	0
<u>0009346313-01</u>	2306	5.3 (N/A)	7.4 (N/A)	12.7	9.2	0
<u>0009343914-01</u>	2307	7.9 (N/A)	10.6 (N/A)	18.5	8.4	0
<u>0009343682-01</u>	2308	8.0 (N/A)	6.8 (N/A)	14.8	8.9	0
<u>0009344474-01</u>	2309	8.6 (N/A)	6.7 (N/A)	15.3	8.8	0
<u>0009342965-01</u>	2310	7.2 (N/A)	9.2 (N/A)	16.4	8.7	0
<u>0009342668-01</u>	2401	24.4 (N/A)	4.7 (N/A)	29.1	7.1	0
<u>0009342643-01</u>	2402	13.1 (N/A)	3.6 (N/A)	16.7	8.7	0
<u>0009344664-01</u>	2403	2.4 (N/A)	9.5 (N/A)	11.9	9.3	0
<u>0009345141-01</u>	2404	2.3 (N/A)	8.5 (N/A)	10.8	9.4	0
<u>0009345612-01</u>	2405	5.9 (N/A)	7.0 (N/A)	13.0	9.1	0
<u>0009345901-01</u>	2406	5.4 (N/A)	7.4 (N/A)	12.8	9.2	0
<u>0009343880-01</u>	2407	7.9 (N/A)	10.5 (N/A)	18.4	8.4	0
<u>0009343716-01</u>	2408	8.0 (N/A)	6.9 (N/A)	14.9	8.9	0
<u>0009342924-01</u>	2409	8.6 (N/A)	6.7 (N/A)	15.3	8.8	0
<u>0009342940-01</u>	2410	7.2 (N/A)	9.4 (N/A)	16.6	8.7	0
<u>0009343542-01</u>	2501	23.9 (N/A)	5.0 (N/A)	28.8	7.2	0
<u>0009342775-01</u>	2502	13.9 (N/A)	3.4 (N/A)	17.3	8.6	0
<u>0009345075-01</u>	2503	2.7 (N/A)	9.4 (N/A)	12.1	9.2	0
<u>0009345216-01</u>	2504	2.6 (N/A)	7.9 (N/A)	10.5	9.4	0
<u>0009345620-01</u>	2505	6.3 (N/A)	6.7 (N/A)	13.0	9.1	0
<u>0009346065-01</u>	2506	5.3 (N/A)	7.4 (N/A)	12.8	9.2	0
<u>0009344367-01</u>	2507	8.4 (N/A)	9.6 (N/A)	18.0	8.5	0
<u>0009343997-01</u>	2508	16.9 (N/A)	8.1 (N/A)	24.9	7.6	0
<u>0009343211-01</u>	2509	17.5 (N/A)	8.0 (N/A)	25.5	7.6	0
<u>0009343393-01</u>	2510	7.6 (N/A)	8.4 (N/A)	16.1	8.7	0



<u>0009343013-01</u>	2601	23.9 (N/A)	5.0 (N/A)	28.9	7.1	0
<u>0009342619-01</u>	2602	13.2 (N/A)	3.7 (N/A)	16.9	8.6	0
<u>0009344631-01</u>	2603	2.5 (N/A)	9.3 (N/A)	11.8	9.3	0
<u>0009345117-01</u>	2604	2.4 (N/A)	8.3 (N/A)	10.7	9.4	0
<u>0009345646-01</u>	2605	6.1 (N/A)	7.0 (N/A)	13.1	9.1	0
<u>0009345950-01</u>	2606	5.4 (N/A)	7.4 (N/A)	12.8	9.2	0
<u>0009343526-01</u>	2607	13.5 (N/A)	9.0 (N/A)	22.5	7.9	0
<u>0009343898-01</u>	2608	14.5 (N/A)	7.4 (N/A)	21.9	8	0
<u>0009342973-01</u>	2701	24.0 (N/A)	5.0 (N/A)	29.0	7.1	0
<u>0009342585-01</u>	2702	13.3 (N/A)	3.6 (N/A)	17.0	8.6	0
<u>0009344599-01</u>	2703	2.6 (N/A)	9.3 (N/A)	11.9	9.3	0
<u>0009345083-01</u>	2704	2.4 (N/A)	8.3 (N/A)	10.8	9.4	0
<u>0009345679-01</u>	2705	6.2 (N/A)	7.0 (N/A)	13.2	9.1	0
<u>0009345984-01</u>	2706	5.4 (N/A)	7.4 (N/A)	12.8	9.2	0
<u>0009343559-01</u>	2707	13.6 (N/A)	9.0 (N/A)	22.6	7.9	0
<u>0009343922-01</u>	2708	14.6 (N/A)	7.3 (N/A)	21.9	8	0
<u>0009343237-01</u>	2801	24.2 (N/A)	5.0 (N/A)	29.3	7.1	0
<u>0009342809-01</u>	2802	14.1 (N/A)	3.4 (N/A)	17.5	8.6	0
<u>0009345109-01</u>	2803	2.8 (N/A)	9.0 (N/A)	11.8	9.3	0
<u>0009345240-01</u>	2804	2.7 (N/A)	7.6 (N/A)	10.3	9.4	0
<u>0009345653-01</u>	2805	6.5 (N/A)	6.7 (N/A)	13.2	9.1	0
<u>0009346032-01</u>	2806	5.6 (N/A)	7.4 (N/A)	12.9	9.1	0
<u>0009343583-01</u>	2807	14.2 (N/A)	8.2 (N/A)	22.4	7.9	0
<u>0009343955-01</u>	2808	14.6 (N/A)	7.3 (N/A)	21.9	8	0
<u>0009342635-01</u>	2901	24.9 (N/A)	4.8 (N/A)	29.7	7	0
<u>0009342551-01</u>	2902	13.4 (N/A)	3.6 (N/A)	17.0	8.6	0
<u>0009344821-01</u>	2903	2.6 (N/A)	9.0 (N/A)	11.6	9.3	0
<u>0009345059-01</u>	2904	2.5 (N/A)	8.1 (N/A)	10.6	9.4	0
<u>0009345703-01</u>	2905	6.3 (N/A)	7.0 (N/A)	13.2	9.1	0
<u>0009346016-01</u>	2906	5.5 (N/A)	7.4 (N/A)	12.9	9.1	0
<u>0009343864-01</u>	2907	8.2 (N/A)	10.1 (N/A)	18.3	8.4	0
<u>0009343831-01</u>	2908	19.4 (N/A)	4.7 (N/A)	24.1	7.7	0
<u>0009344177-01</u>	2909	20.1 (N/A)	4.6 (N/A)	24.7	7.7	0
<u>0009342916-01</u>	2910	7.5 (N/A)	8.6 (N/A)	16.1	8.7	0
<u>0009342601-01</u>	3001	25.0 (N/A)	4.8 (N/A)	29.8	7	0
<u>0009342528-01</u>	3002	13.5 (N/A)	3.7 (N/A)	17.2	8.6	0
<u>0009344797-01</u>	3003	2.6 (N/A)	9.0 (N/A)	11.6	9.3	0
<u>0009345026-01</u>	3004	2.5 (N/A)	8.0 (N/A)	10.6	9.4	0



<u>0009345737-01</u>	3005	6.4 (N/A)	6.9 (N/A)	13.3	9.1	0
<u>0009346040-01</u>	3006	5.6 (N/A)	7.4 (N/A)	13.0	9.1	0
<u>0009343849-01</u>	3007	8.3 (N/A)	9.7 (N/A)	18.1	8.4	0
<u>0009343732-01</u>	3008	8.5 (N/A)	6.4 (N/A)	14.9	8.9	0
<u>0009342957-01</u>	3009	9.1 (N/A)	6.1 (N/A)	15.2	8.9	0
<u>0009344490-01</u>	3010	7.6 (N/A)	8.5 (N/A)	16.1	8.7	0
<u>0009343575-01</u>	3101	24.3 (N/A)	5.0 (N/A)	29.3	7.1	0
<u>0009342833-01</u>	3102	14.3 (N/A)	3.4 (N/A)	17.7	8.5	0
<u>0009345133-01</u>	3103	2.9 (N/A)	8.7 (N/A)	11.6	9.3	0
<u>0009345273-01</u>	3104	2.8 (N/A)	7.3 (N/A)	10.2	9.4	0
<u>0009345687-01</u>	3105	6.6 (N/A)	6.7 (N/A)	13.3	9.1	0
<u>0009346008-01</u>	3106	5.7 (N/A)	7.3 (N/A)	13.0	9.1	0
<u>0009344391-01</u>	3107	8.7 (N/A)	9.0 (N/A)	17.7	8.5	0
<u>0009344086-01</u>	3108	8.9 (N/A)	5.9 (N/A)	14.8	8.9	0
<u>0009343062-01</u>	3109	9.4 (N/A)	5.8 (N/A)	15.2	8.9	0
<u>0009343427-01</u>	3110	8.0 (N/A)	7.7 (N/A)	15.7	8.8	0
<u>0009342577-01</u>	3201	25.1 (N/A)	4.9 (N/A)	30.1	6.9	0
<u>0009342494-01</u>	3202	13.6 (N/A)	3.6 (N/A)	17.2	8.6	0
<u>0009344763-01</u>	3203	2.7 (N/A)	8.8 (N/A)	11.4	9.3	0
<u>0009344995-01</u>	3204	2.6 (N/A)	7.8 (N/A)	10.4	9.4	0
<u>0009345760-01</u>	3205	6.4 (N/A)	6.9 (N/A)	13.3	9.1	0
<u>0009346073-01</u>	3206	5.6 (N/A)	7.4 (N/A)	13.0	9.1	0
<u>0009343815-01</u>	3207	8.4 (N/A)	9.5 (N/A)	17.9	8.5	0
<u>0009343765-01</u>	3208	8.6 (N/A)	6.3 (N/A)	14.9	8.9	0
<u>0009343096-01</u>	3209	9.2 (N/A)	6.0 (N/A)	15.2	8.9	0
<u>0009344482-01</u>	3210	7.7 (N/A)	8.4 (N/A)	16.1	8.7	0
<u>0009342544-01</u>	3301	25.1 (N/A)	4.8 (N/A)	29.9	7	0
<u>0009342460-01</u>	3302	13.7 (N/A)	3.6 (N/A)	17.4	8.6	0
<u>0009344730-01</u>	3303	2.7 (N/A)	8.7 (N/A)	11.4	9.3	0
<u>0009344961-01</u>	3304	2.7 (N/A)	7.7 (N/A)	10.4	9.4	0
<u>0009345794-01</u>	3305	6.5 (N/A)	6.9 (N/A)	13.4	9.1	0
<u>0009346107-01</u>	3306	5.7 (N/A)	7.3 (N/A)	13.0	9.1	0
<u>0009343781-01</u>	3307	8.4 (N/A)	9.5 (N/A)	17.9	8.5	0
<u>0009343807-01</u>	3308	8.6 (N/A)	6.1 (N/A)	14.7	8.9	0
<u>0009343120-01</u>	3309	9.2 (N/A)	6.1 (N/A)	15.2	8.9	0
<u>0009344458-01</u>	3310	7.7 (N/A)	8.3 (N/A)	16.0	8.8	0
<u>0009343609-01</u>	3401	24.6 (N/A)	4.9 (N/A)	29.4	7.1	0
<u>0009342866-01</u>	3402	14.5 (N/A)	3.4 (N/A)	17.9	8.5	0



<u>0009345166-01</u>	3403	3.0 (N/A)	8.5 (N/A)	11.5	9.3	0
<u>0009345307-01</u>	3404	2.9 (N/A)	7.2 (N/A)	10.2	9.4	0
<u>0009345711-01</u>	3405	6.8 (N/A)	6.6 (N/A)	13.4	9.1	0
<u>0009345976-01</u>	3406	5.8 (N/A)	7.3 (N/A)	13.1	9.1	0
<u>0009344425-01</u>	3407	8.9 (N/A)	8.8 (N/A)	17.6	8.6	0
<u>0009344029-01</u>	3408	17.5 (N/A)	7.6 (N/A)	25.1	7.6	0
<u>0009343245-01</u>	3409	18.2 (N/A)	7.5 (N/A)	25.8	7.5	0
<u>0009343450-01</u>	3410	8.2 (N/A)	7.6 (N/A)	15.8	8.8	0
<u>0009342932-01</u>	3501	24.5 (N/A)	5.0 (N/A)	29.5	7.1	0
<u>0009342429-01</u>	3502	13.8 (N/A)	3.6 (N/A)	17.4	8.6	0
<u>0009344706-01</u>	3503	2.8 (N/A)	8.5 (N/A)	11.3	9.3	0
<u>0009344938-01</u>	3504	2.7 (N/A)	7.7 (N/A)	10.4	9.4	0
<u>0009345828-01</u>	3505	6.5 (N/A)	6.9 (N/A)	13.4	9.1	0
<u>0009346131-01</u>	3506	5.8 (N/A)	7.3 (N/A)	13.1	9.1	0
<u>0009343617-01</u>	3507	14.0 (N/A)	8.4 (N/A)	22.4	7.9	0
<u>0009343989-01</u>	3508	15.0 (N/A)	6.8 (N/A)	21.8	8	0
<u>0009342908-01</u>	3601	24.6 (N/A)	5.0 (N/A)	29.6	7.1	0
<u>0009342395-01</u>	3602	13.9 (N/A)	3.6 (N/A)	17.5	8.6	0
<u>0009344672-01</u>	3603	2.8 (N/A)	8.5 (N/A)	11.2	9.4	0
<u>0009344904-01</u>	3604	2.7 (N/A)	7.6 (N/A)	10.3	9.4	0
<u>0009345851-01</u>	3605	6.5 (N/A)	6.8 (N/A)	13.4	9.1	0
<u>0009346164-01</u>	3606	5.8 (N/A)	7.3 (N/A)	13.1	9.1	0
<u>0009343641-01</u>	3607	14.1 (N/A)	8.3 (N/A)	22.4	7.9	0
<u>0009344011-01</u>	3608	15.1 (N/A)	6.8 (N/A)	21.9	8	0
<u>0009343260-01</u>	3701	24.9 (N/A)	5.0 (N/A)	29.9	7	0
<u>0009342890-01</u>	3702	14.6 (N/A)	3.3 (N/A)	17.9	8.5	0
<u>0009345190-01</u>	3703	3.1 (N/A)	8.1 (N/A)	11.2	9.4	0
<u>0009345331-01</u>	3704	3.1 (N/A)	7.1 (N/A)	10.2	9.4	0
<u>0009345745-01</u>	3705	6.9 (N/A)	6.6 (N/A)	13.6	9.1	0
<u>0009345943-01</u>	3706	5.9 (N/A)	7.2 (N/A)	13.1	9.1	0
<u>0009343674-01</u>	3707	14.8 (N/A)	7.5 (N/A)	22.3	7.9	0
<u>0009344045-01</u>	3708	15.7 (N/A)	6.3 (N/A)	22.0	8	0
<u>0009342510-01</u>	3801	25.5 (N/A)	4.8 (N/A)	30.3	6.9	0
<u>0009342361-01</u>	3802	14.0 (N/A)	3.6 (N/A)	17.6	8.6	0
<u>0009344649-01</u>	3803	2.8 (N/A)	8.5 (N/A)	11.4	9.3	0
<u>0009344888-01</u>	3804	2.8 (N/A)	7.6 (N/A)	10.3	9.4	0
<u>0009345877-01</u>	3805	6.6 (N/A)	6.9 (N/A)	13.5	9.1	0
<u>0009346198-01</u>	3806	5.9 (N/A)	7.3 (N/A)	13.2	9.1	0



<u>0009344318-01</u>	3807	12.4 (N/A)	7.1 (N/A)	19.6	8.3	0
<u>0009344102-01</u>	3808	13.6 (N/A)	4.9 (N/A)	18.5	8.4	0
<u>0009342486-01</u>	3901	25.6 (N/A)	4.9 (N/A)	30.5	6.9	0
<u>0009342338-02</u>	3902	14.0 (N/A)	3.5 (N/A)	17.6	8.6	0
<u>0009344607-01</u>	3903	2.9 (N/A)	8.5 (N/A)	11.4	9.3	0
<u>0009344839-01</u>	3904	2.8 (N/A)	7.5 (N/A)	10.3	9.4	0
<u>0009345489-01</u>	3905	6.7 (N/A)	6.9 (N/A)	13.5	9.1	0
<u>0009346222-01</u>	3906	5.9 (N/A)	7.3 (N/A)	13.2	9.1	0
<u>0009344342-01</u>	3907	9.5 (N/A)	7.8 (N/A)	17.3	8.6	0
<u>0009344136-01</u>	3908	10.6 (N/A)	5.3 (N/A)	15.8	8.8	0
<u>0009343633-01</u>	4001	24.9 (N/A)	5.0 (N/A)	29.9	7	0
<u>0009342346-01</u>	4002	14.8 (N/A)	3.5 (N/A)	18.3	8.4	0
<u>0009345224-01</u>	4003	3.2 (N/A)	8.0 (N/A)	11.2	9.4	0
<u>0009345356-01</u>	4004	3.1 (N/A)	7.0 (N/A)	10.1	9.4	0
<u>0009345778-01</u>	4005	7.0 (N/A)	6.5 (N/A)	13.5	9.1	0
<u>0009345927-01</u>	4006	6.0 (N/A)	7.1 (N/A)	13.1	9.1	0
<u>0009344284-01</u>	4007	10.0 (N/A)	7.1 (N/A)	17.1	8.6	0
<u>0009344078-01</u>	4008	11.1 (N/A)	4.8 (N/A)	15.9	8.8	0
<u>0009343666-01</u>	4101	27.8 (N/A)	5.4 (N/A)	33.2	6.7	0
<u>0009342379-01</u>	4102	23.1 (N/A)	5.6 (N/A)	28.7	7.2	0
<u>0009345257-01</u>	4103	3.0 (N/A)	8.4 (N/A)	11.4	9.3	0
<u>0009345406-01</u>	4104	2.9 (N/A)	7.4 (N/A)	10.2	9.4	0
<u>0009345547-01</u>	4105	6.8 (N/A)	6.7 (N/A)	13.4	9.1	0
<u>0009346255-01</u>	4106	6.0 (N/A)	7.2 (N/A)	13.2	9.1	0
<u>0009344383-01</u>	4107	9.6 (N/A)	7.7 (N/A)	17.3	8.6	0
<u>0009344169-01</u>	4108	10.5 (N/A)	5.2 (N/A)	15.7	8.8	0
<u>0009343690-01</u>	4201	27.8 (N/A)	5.4 (N/A)	33.2	6.7	0
<u>0009342403-01</u>	4202	23.2 (N/A)	5.6 (N/A)	28.8	7.2	0
<u>0009345281-01</u>	4203	3.0 (N/A)	8.4 (N/A)	11.3	9.3	0
<u>0009345372-01</u>	4204	2.9 (N/A)	7.4 (N/A)	10.2	9.4	0
<u>0009345505-01</u>	4205	6.8 (N/A)	6.7 (N/A)	13.5	9.1	0
<u>0009346289-01</u>	4206	6.0 (N/A)	7.2 (N/A)	13.2	9.1	0
<u>0009344409-01</u>	4207	9.7 (N/A)	7.6 (N/A)	17.3	8.6	0
<u>0009344193-01</u>	4208	10.6 (N/A)	5.3 (N/A)	15.8	8.8	0
<u>0009343724-01</u>	4301	27.9 (N/A)	5.3 (N/A)	33.3	6.7	0
<u>0009342437-01</u>	4302	23.2 (N/A)	5.6 (N/A)	28.8	7.2	0
<u>0009345315-01</u>	4303	3.0 (N/A)	8.3 (N/A)	11.3	9.3	0
<u>0009345380-01</u>	4304	2.9 (N/A)	7.2 (N/A)	10.1	9.4	0



<u>0009345802-01</u>	4305	6.8 (N/A)	6.7 (N/A)	13.5	9.1	0
<u>0009346305-01</u>	4306	6.0 (N/A)	7.2 (N/A)	13.2	9.1	0
<u>0009344433-01</u>	4307	9.7 (N/A)	7.5 (N/A)	17.1	8.6	0
<u>0009344227-01</u>	4308	10.6 (N/A)	5.2 (N/A)	15.8	8.8	0
<u>0009343757-01</u>	4401	32.5 (N/A)	4.4 (N/A)	36.9	6.3	0
<u>0009342452-01</u>	4402	23.4 (N/A)	5.4 (N/A)	28.8	7.2	0
<u>0009345430-01</u>	4403	3.1 (N/A)	8.4 (N/A)	11.5	9.3	0
<u>0009345414-01</u>	4404	2.9 (N/A)	7.1 (N/A)	10.0	9.5	0
<u>0009345836-01</u>	4405	6.8 (N/A)	6.7 (N/A)	13.5	9.1	0
<u>0009346321-01</u>	4406	11.2 (N/A)	7.8 (N/A)	19.0	8.4	0
<u>0009344466-01</u>	4407	20.9 (N/A)	8.6 (N/A)	29.5	7.1	0
<u>0009344250-01</u>	4408	22.3 (N/A)	6.1 (N/A)	28.3	7.2	0

Explanatory notes

About this ratings

The thermal performance star rating in this Certificate is the average rating of all NCC Class 2 dwellings in an apartment block. Individual unit ratings are listed in the 'Summary of all dwellings' section of this Certificate.

NatHERS ratings use computer modelling to evaluate a home's energy efficiency and performance. They use localised climate

data and standard assumptions on how people use their home to predict the energy loads and societal cost. The thermal performance star rating uses the home's building specifications, layout, orientation and fabric (i.e. walls, windows, floors, roofs and ceilings) to predict the heating and cooling energy loads.

For more details about an individual dwelling's assessment, refer to the individual dwelling's NatHERS Certificate (accessible via link).

Accredited Assessors

For high quality NatHERS Certificates, always use an accredited or licenced assessor registered with an Assessor Accrediting Organisation (AAO). AAOs have strict quality assurance processes, and professional development requirements ensuring consistently high standards for assessments.

Non-accredited assessors (Raters) have no ongoing training requirements and are not quality assured.

Licensed assessors in the Australian Capital Territory (ACT) can produce assessments for regulatory purposes only, using endorsed software, as listed on the ACT licensing register.

Any queries about this report should be directed to the assessor. If the assessor is unable to address questions or concerns, contact the AAO specified on the front of this certificate.

Disclaimer

The NatHERS Certificate format is developed by the NatHERS Administrator. However, the content in certificates is entered by the assessor. It is the assessor's responsibility to use NatHERS accredited software correctly and follow the NatHERS Technical

Note to produce a NatHERS Certificate.

The predicted annual energy use, cost and greenhouse gas emissions in this NatHERS Certificate are an estimate based on an assessment of the dwelling's design by the assessor. It is not a prediction of actual energy use, cost or emissions. The information and ratings may be used to compare how other dwellings are likely to perform when used in a similar way.

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



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