

**BASIX ASSESSMENT REPORT**  
**FOR**  
**19-21 THE CORSO MANLY NSW**  
**PREPARED FOR**  
**HILROK PROPERTIES PTY LTD**

**DATE:** 7<sup>th</sup> MAY 2019

**OUR REFERENCE:** SDRPT-19010126

**ENGINEER:** BEN SHOJAEI

**REVISION HISTORY**

REVISION	DATE	BY
A - Initial	07/05/19	BS

## TABLE OF CONTENTS

1	EXECUTIVE SUMMARY .....	4
2	INTRODUCTION .....	5
2.1	INFORMATION USED IN REVIEW.....	5
2.2	CLIMATE ZONE.....	6
3	BASIX WATER SECTION .....	7
4	BASIX THERMAL COMFORT SECTION .....	7
5	BASIX ENERGY SECTION .....	8
6	DISCLAIMER .....	9
7	BASIX CERTIFICATE.....	10

## 1 EXECUTIVE SUMMARY

Jones Nicholson has been commissioned by Hilrok Properties Pty Ltd to assess the interaction of the proposed residential development at 19-21 The Corso Manly NSW, with the local environment in terms of BASIX compliance.

BASIX Certificate is a DA requirement and demonstrates compliance with the NSW Government's sustainability targets. BASIX assessment and certification has been completed for this project (Certificate No. 1010747M\_04).

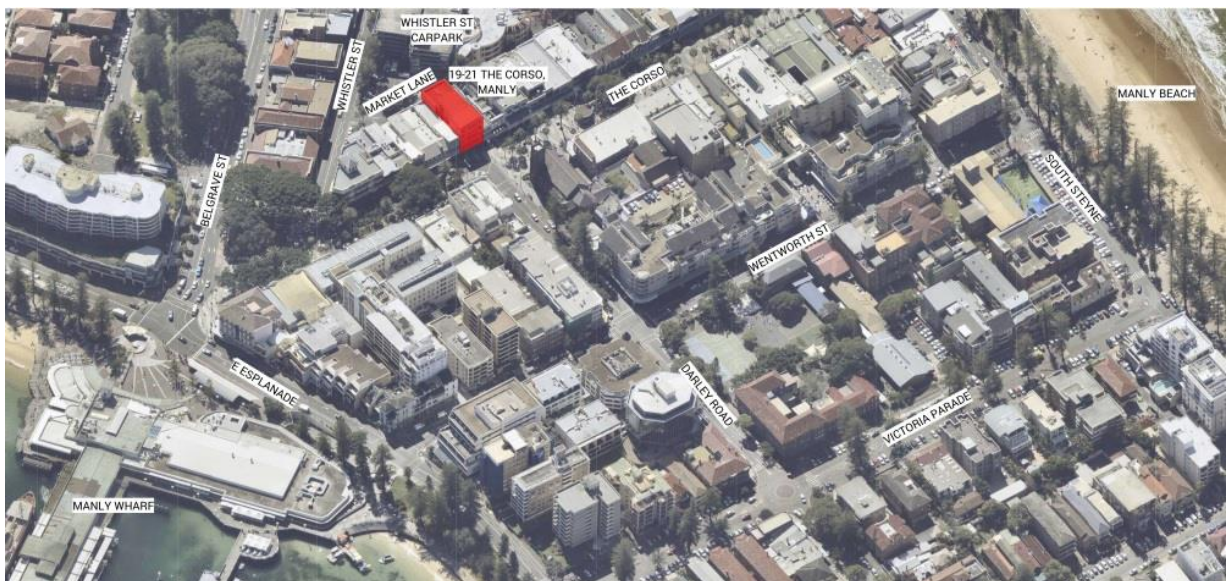
Dwellings within the development have been assessed in terms of their passive energy design using the BASIX protocol. They have also been assessed in terms of their ability to conserve water and also to minimise energy consumption via appliances and hot water etc.

With the recommendations provided in the BASIX certificate the development meets and exceeds the minimum requirements for all following areas.

- Energy Efficiency
- Water Efficiency
- Thermal Comfort

This development will achieve the following targets:

- Energy Efficiency: 35% reduction (minimum requirements under BASIX: 35%)
- Water Efficiency: 40% reduction (minimum requirements under BASIX: 40%)
- Thermal Comfort: will pass the thermal performance requirements under BASIX.



Location: 19-21 The Corso Manly NSW

## 2 INTRODUCTION

BASIX is a NSW State Planning Policy Tool which assesses the environmental performance of new residential premises against a range water, energy and greenhouse gas emissions targets. The assessment has three core components, BASIX Thermal Comfort, BASIX Water and BASIX Energy.

The thermal comfort assessment requires that the thermal performance of dwellings is evaluated, and measures put in place to ensure annual heating and cooling loads do not exceed pre-defined limits without compromising the occupants' thermal comfort. This assessment uses computer simulation using the preliminary architectural design drawings provided to evaluate the building fabric thermal performance and passive solar design features such as orientation and solar shading.

The energy section evaluates gas and electrical energy used for heating, cooling lighting, ventilation and appliances. The BASIX Energy target requires the development to uses 35% less energy than the NSW average.

The water assessment takes account of landscaping, stormwater management as well as water efficiency performance of fixtures and fitting such as taps and showers. The BASIX target for water requires that potable water consumption is at least 40% lower than the NSW average.

Note: this report is only a guide to the draft BASIX certificate, for full details of BASIX requirements please refer to the BASIX certificate.

### 2.1 INFORMATION USED IN REVIEW

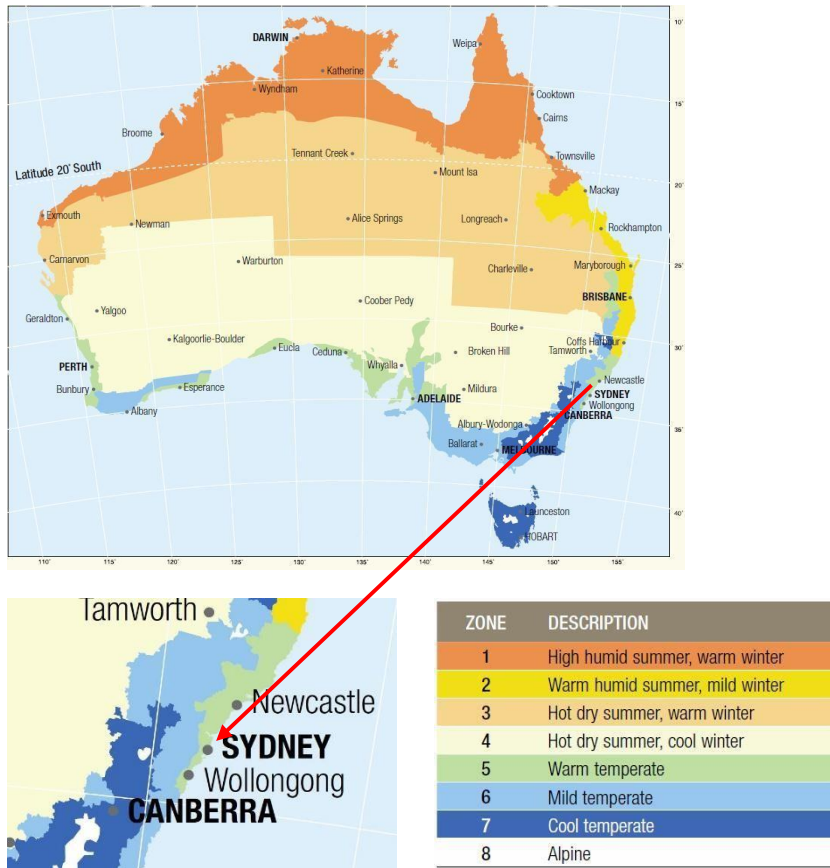
Our review is based on the following architectural drawings provided by NBRS Architecture in May 2019.

NO	SHEET NAME	REVISION DATE
01	SITE CONTEXT	02/05/2019
02	SITE ANALYSIS AND ROOF PLAN	02/05/2019
03	EXISTING FLOOR PLANS	02/05/2019
04	EXISTING FLOOR PLANS	02/05/2019
05	GROUND AND FIRST FLOOR PLAN	02/05/2019
06	SECOND AND THIRD FLOOR PLAN	02/05/2019
07	ELEVATIONS	02/05/2019
08	ELEVATIONS	02/05/2019
09	SECTIONS	02/05/2019
10	STREET VIEW - MARKET PLACE	02/05/2019
11	SHADOW DIAGRAMS	02/05/2019
12	SHADOW DIAGRAMS	02/05/2019
13	MATERIALS & FINISHES	02/05/2019

## 2.2 CLIMATE ZONE

The climate zone is defined by the NCC as ‘an area for specific locations, having energy efficiency provisions based upon a range of similar climatic characteristics.

The development is located in Manly NSW which is within Climate Zone 5 (Warm temperate) of National Construction Code (Figure A1.1 - NCC 2016).



Climate Zone for the development – Source: NCC Climate Zone

### 3 BASIX WATER SECTION

Common Areas and Central Systems	
Common areas	<ul style="list-style-type: none"> <li>• 5-star (Water Rating) taps</li> <li>• Common area lawn (m<sup>2</sup>): Nil</li> <li>• Common area garden (m<sup>2</sup>): Nil</li> </ul>
Private Dwellings	
Fixtures for apartments	<ul style="list-style-type: none"> <li>• 3-star (Water Rating) showerheads with a flow rate &gt;4.5 but ≤ 6L/min</li> <li>• 4-star (Water Rating) toilets</li> <li>• 6-star (Water Rating) kitchen taps</li> <li>• 6-star (Water Rating) bathroom taps</li> <li>• 4.5-star (Water Rating) dishwashers</li> </ul>

### 4 BASIX THERMAL COMFORT SECTION

The development shall comply with the minimum thermal performance requirements based on BASIX thermal protocol; computer simulation was used to assess the expected performance of the development.

Process and background information:

- BERS Pro calculates the transient hourly heat gains and losses for each space inside a building taking into account the building's thermal storage, typical residential occupancy and operational profiles plus hourly weather data for the site
- Building geometry and orientation were modelled according to supplied drawings
- The building fabric requirements are summarised in Table 2 below. The preliminary performance requirements are based on the construction materials nominated by the architect.

Table 1 – building performance requirements

External wall thermal insulation		Added R2.2
Internal wall thermal insulation (party walls, walls to corridors, etc.)		Added R1.5
Ceiling/roof thermal insulation:		Added R3.8
Glazing performance requirements (i.e. Total System)	Units 3,4,7,8,9 and 10	Maximum Total SHGC (AFRC) ≤ 0.4 Maximum Total U-Value (AFRC) ≤ 4.5 (W/m <sup>2</sup> .K)
	Units 1,2,5,6 and 11	Maximum Total SHGC (AFRC) ≤ 0.33 Maximum Total U-Value (AFRC) ≤ 3.8 (W/m <sup>2</sup> .K)

**Note:** The preliminary thermal insulation and glazing performance requirements nominated for BASIX purposes refer to the estimated minimum BASIX compliance requirements only. The specified performance values therefore do not consider requirements for any other disciplines such as Acoustics, Fire or Safety compliance. Where required, the development shall comply with any additional requirements related to other disciplines in addition to the BASIX compliance requirements detailed in this report.

## 5 BASIX ENERGY SECTION

The Energy performance of the development has been assessed using the online BASIX Tool. The assessment has considered Common Area and Central System features including the lifts, ventilation and lighting for common areas (corridors, lobbies, car park etc), centralised domestic hot water and the efficiency of preferred lighting and appliances in the dwellings.

The proposed development will meet the mandatory BASIX Energy target of 35% as long as the energy commitments detailed in Table 3 are installed.

Table 3: Energy Commitments

Component		Commitment
Common Areas	Lifts	<ul style="list-style-type: none"> <li>Quantity: 1, Geared traction with VVVF technology</li> </ul>
	Swimming pool / Sauna	<ul style="list-style-type: none"> <li>N/A</li> </ul>
	Ventilation	<ul style="list-style-type: none"> <li>Switch Room: no mechanical ventilation</li> <li>Garbage Rooms: Continuous ventilation (exhaust)</li> <li>Plant/Service Rooms: no mechanical ventilation</li> <li>Ground floor lobby and Hallways: ventilation supply only, controlled with time clock</li> </ul>
	Lighting	<ul style="list-style-type: none"> <li>Lift Cars: LED, connected to lift call button</li> <li>Switch Room: LED lighting with manual on/off switch</li> <li>Garbage Rooms: LED lighting with motion sensors</li> <li>Plant/Service Room: LED lighting with manual on/off switch</li> <li>Ground floor lobby and hallways: LED lighting with motion sensors</li> </ul>
	Hot Water	<ul style="list-style-type: none"> <li>Gas fired storage (manifolded)</li> <li>Piping insulation (ringmain &amp; supply risers):               <ul style="list-style-type: none"> <li>(a) Piping external to building: R0.75;</li> <li>(b) Piping internal to building: R0.75.</li> </ul> </li> </ul>
Private Dwellings	Ventilation	<ul style="list-style-type: none"> <li>Kitchen Exhaust: Individual fan, not ducted, manual on/ timer off.</li> <li>Bathroom &amp; Laundry Exhaust: Individual fan, ducted to façade or roof, interlocked to light</li> </ul>
	Cooling	<ul style="list-style-type: none"> <li>Living areas: 1-phase air conditioning 6 Star</li> <li>Bedrooms: 1-phase air conditioning 6 Star</li> </ul>
	Heating	<ul style="list-style-type: none"> <li>Living areas: 1-phase air conditioning 5.5 Star</li> <li>Bedrooms: 1-phase air conditioning 5.5 Star</li> </ul>
	Lighting	<ul style="list-style-type: none"> <li>Light fittings in all hallways, laundries, bathrooms, kitchens, bedrooms and living areas to use Fluorescent or LED lights with dedicated fittings<sup>1</sup></li> </ul>



Component		Commitment
	Other	<ul style="list-style-type: none"> <li>• Gas cooktop and electric oven</li> <li>• Well-ventilated fridge space</li> <li>• Indoor or sheltered clothes drying lines to all units</li> <li>• Unit 11 to also have an outdoor clothes drying line</li> <li>• All units must install 4.5-star (energy rating) dishwashers</li> <li>• All units must install 6-star (energy rating) clothes dryer</li> </ul>

## 6 DISCLAIMER

BASIX assessment has been prepared using the information described in this report. Whilst JN has endeavoured to ensure the information used is accurate, no responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact JN for detailed advice which will take into account that party's particular requirements.

Computer performance assessment provides an estimate of building performance. This estimate is based on a necessarily simplified and idealised version of the building that does not and cannot fully represent all the intricacies of the building once built. As a result, simulation results only represent an interpretation of the potential performance of the building. No guarantee or warranty of building performance in practice can be based on simulation results alone. JN and its employees and agents shall not be liable for any loss arising because of, any person using or relying on the Report and whether caused by reason or error, negligent act or omission in the report. The study is based on the preliminary design documents (DA drawings) and provided as a guide only, the BASIX requirements may require re-assessment once the architectural and building services design drawings have progressed to the detailed design stage and prior to construction.

Performance of the completed building may be significantly affected by the quality of construction; the quality of commissioning, ongoing management of the building, and the way the building is operated, monitored and maintained. Building fabric inputs require verifiable manufacturer data to confirm thermal properties.

**7 BASIX CERTIFICATE**

# BASIX<sup>®</sup>Certificate

Building Sustainability Index [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)

## Multi Dwelling

Certificate number: 1010747M\_04

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 06/10/2017 published by the Department. This document is available at [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)

Secretary

Date of issue: Tuesday, 07 May 2019

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



**If any changes are required to this BASIX Certificate, please contact Jones Nicholson with following contact details:**

**- Project reference: 19-21 The Corso Manly NSW**




**- Contact number: 0430 108 801**

Project summary		
Project name	19-21 The Corso Manly NSW_04	
Street address	19-21 The Corso Street Manly 2095	
Local Government Area	Northern Beaches Council	
Plan type and plan number	strata 12989	
Lot no.	N.A	
Section no.	-	
No. of residential flat buildings	1	
No. of units in residential flat buildings	11	
No. of multi-dwelling houses	0	
No. of single dwelling houses	0	
Project score		
Water	✔ 40	Target 40
Thermal Comfort	✔ Pass	Target Pass
Energy	✔ 35	Target 35

Certificate Prepared by
Name / Company Name: Jones Nicholson Pty Ltd
ABN (if applicable): 51003316032

# Description of project

Project address	
Project name	19-21 The Corso Manly NSW_04
Street address	19-21 The Corso Street Manly 2095
Local Government Area	Northern Beaches Council
Plan type and plan number	strata 12989
Lot no.	N.A
Section no.	-
Project type	
No. of residential flat buildings	1
No. of units in residential flat buildings	11
No. of multi-dwelling houses	0
No. of single dwelling houses	0
Site details	
Site area (m <sup>2</sup> )	523
Roof area (m <sup>2</sup> )	340
Non-residential floor area (m <sup>2</sup> )	-
Residential car spaces	0
Non-residential car spaces	-

Common area landscape		
Common area lawn (m <sup>2</sup> )	0.0	
Common area garden (m <sup>2</sup> )	0.0	
Area of indigenous or low water use species (m <sup>2</sup> )	0.0	
Assessor details		
Assessor number	BDAV/13/1639	
Certificate number	0003875623	
Climate zone	56	
Project score		
Water	 40	Target 40
Thermal Comfort	 Pass	Target Pass
Energy	 35	Target 35

## Description of project

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

### Residential flat buildings - Building1, 11 dwellings, 4 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m <sup>2</sup> )	Unconditioned floor area (m <sup>2</sup> )	Area of garden & lawn (m <sup>2</sup> )	Indigenous species (min area m <sup>2</sup> )
1	1	53.0	0.0	0.0	0.0
5	1	53.0	0.0	0.0	0.0
9	2	72.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m <sup>2</sup> )	Unconditioned floor area (m <sup>2</sup> )	Area of garden & lawn (m <sup>2</sup> )	Indigenous species (min area m <sup>2</sup> )
2	1	54.0	0.0	0.0	0.0
6	1	54.0	0.0	0.0	0.0
10	2	84.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m <sup>2</sup> )	Unconditioned floor area (m <sup>2</sup> )	Area of garden & lawn (m <sup>2</sup> )	Indigenous species (min area m <sup>2</sup> )
3	2	85.0	0.0	0.0	0.0
7	2	85.0	0.0	0.0	0.0
11	2	84.0	0.0	0.0	0.0

Dwelling no.	No. of bedrooms	Conditioned floor area (m <sup>2</sup> )	Unconditioned floor area (m <sup>2</sup> )	Area of garden & lawn (m <sup>2</sup> )	Indigenous species (min area m <sup>2</sup> )
4	2	85.0	0.0	0.0	0.0
8	2	85.0	0.0	0.0	0.0

## Description of project

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

### Common areas of unit building - Building1

Common area	Floor area (m <sup>2</sup> )
Lift car (No.1)	-
Plant or service room (No. 1)	28.0

Common area	Floor area (m <sup>2</sup> )
Switch room (No. 1)	5.0
Ground floor lobby type (No. 1)	31.0

Common area	Floor area (m <sup>2</sup> )
Garbage room (No. 1)	21.0
Hallway/lobby type (No. 1)	68.0

# Schedule of BASIX commitments

## 1. Commitments for Residential flat buildings - Building1

### (a) Dwellings

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

### (b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

## 2. Commitments for multi-dwelling houses

## 3. Commitments for single dwelling houses

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

- (i) Water
- (ii) Energy

## Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

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

#### (a) Dwellings

(i) Water	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.			
(b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).	✓	✓	
(c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.		✓	✓
(d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.		✓	✓
(e) The applicant must install: <ul style="list-style-type: none"> <li>(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</li> <li>(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.</li> </ul>		✓ ✓	✓ ✓
(e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.	✓	✓	
(f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).		✓	
(g) The pool or spa must be located as specified in the table.	✓	✓	
(h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.	✓	✓	✓



Dwelling no.	Fixtures					Appliances		Individual pool				Individual spa		
	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	3 star (> 4.5 but <= 6 L/min)	4 star	6 star	6 star	no	-	4 star	-	-	-	-	-	-	-

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

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

<b>(ii) Energy</b>	<b>Show on DA plans</b>	<b>Show on CC/CDC plans &amp; specs</b>	<b>Certifier check</b>
(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".		✔	

	<b>Hot water</b>	<b>Bathroom ventilation system</b>		<b>Kitchen ventilation system</b>		<b>Laundry ventilation system</b>	
<b>Dwelling no.</b>	<b>Hot water system</b>	<b>Each bathroom</b>	<b>Operation control</b>	<b>Each kitchen</b>	<b>Operation control</b>	<b>Each laundry</b>	<b>Operation control</b>
All dwellings	central hot water system 1	individual fan, ducted to façade or roof	interlocked to light	individual fan, not ducted	manual switch on/off	individual fan, ducted to façade or roof	interlocked to light

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
11	1-phase airconditioning 6 Star	1-phase airconditioning 6 Star	1-phase airconditioning 5.5 Star	1-phase airconditioning 5.5 Star	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	yes
1, 2, 5, 6	1-phase airconditioning 6 Star	1-phase airconditioning 6 Star	1-phase airconditioning 5.5 Star	1-phase airconditioning 5.5 Star	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	-
All other dwellings	1-phase airconditioning 6 Star	1-phase airconditioning 6 Star	1-phase airconditioning 5.5 Star	1-phase airconditioning 5.5 Star	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	1	-

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
11	-	-	-	-	gas cooktop & electric oven	-	yes	4.5 star	-	6 star	no	yes
All other dwellings	-	-	-	-	gas cooktop & electric oven	-	yes	4.5 star	-	6 star	yes	no

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			

<b>(iii) Thermal Comfort</b>	<b>Show on DA plans</b>	<b>Show on CC/CDC plans &amp; specs</b>	<b>Certifier check</b>
(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.	✔	✔	✔

<b>Thermal loads</b>		
Dwelling no.	Area adjusted heating load (in mJ/m <sup>2</sup> /yr)	Area adjusted cooling load (in mJ/m <sup>2</sup> /yr)
1	38.5	24.2
2	36.2	25.4
3	39.1	25.1
4	37.1	24.2
5	36.1	24.1
6	38.1	25.1
7	39.2	24.5
8	41.3	25.1
9	41.4	25.1

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m <sup>2</sup> /yr)	Area adjusted cooling load (in mJ/m <sup>2</sup> /yr)
10	40.1	24.6
All other dwellings	42.1	25.4

**(b) Common areas and central systems/facilities**

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

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	no common facility	no common facility	5 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Fire sprinkler system (No. 1)	-	-	-

<b>(ii) Energy</b>	<b>Show on DA plans</b>	<b>Show on CC/CDC plans &amp; specs</b>	<b>Certifier check</b>
(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.		✔	✔

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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 car (No.1)	-	-	light-emitting diode	connected to lift call button	No
Switch room (No. 1)	no mechanical ventilation	-	light-emitting diode	manual on / manual off	No
Garbage room (No. 1)	ventilation exhaust only	-	light-emitting diode	motion sensors	No
Plant or service room (No. 1)	no mechanical ventilation	-	light-emitting diode	manual on / manual off	No
Ground floor lobby type (No. 1)	ventilation supply only	time clock or BMS controlled	light-emitting diode	motion sensors	No
Hallway/lobby type (No. 1)	ventilation supply only	time clock or BMS controlled	light-emitting diode	motion sensors	No

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

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

##### (b) Common areas and central systems/facilities

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

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



## 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).