



To us, it's more than just work.

20 Shepherd St, Liverpool

## BASIX Report Revision 2

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Project No.27085

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Date:

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## Revision

REVISION	DATE	COMMENT	APPROVED BY
2	11/11/2015	DA Issue	NCJ
1	04/08/2015	DA Issue	NCJ
0	07/11/2014	DA Issue	NCJ

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# 20 Shepherd St, Liverpool

## Summary of Assessment

Wood & Grieve Engineers have completed a BASIX Assessment for the proposed multi-unit residential development at 20 Shepherd Street / 2 & 5 Atkinson Street, Liverpool, NSW 2170. The assessment has been based upon the Architectural Drawings (04/11/2015) prepared by Woods Bagot.

In summary, we can confirm the following outcome of the BASIX analysis:

- It has been determined that the proposed building shall achieve a BASIX Certification with the following scores:
  - Water: 40% (Required target: 40%)
  - Thermal Comfort: pass (Required target: pass)
  - Energy: 20% (Required target: 20%)
- Our assessment work has reviewed all apartments based on the architectural drawing issue 4 November 2015, as prepared by Woods Bagot.
- Detail regarding building services has been prepared via consultation with the relevant project consulting engineers, architect and client.
- Further information regarding the thermal comfort and building fabric specification has been outlined within Section 3.0 of this report.
- Note – The BASIX Certificate is attached within Appendix B of this report.

# 20 Shepherd St, Liverpool

## 1 Introduction

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Wood and Grieve Engineers have completed a Building Sustainability Index (BASIX) assessment for the proposed multi-unit residential development at 20 Shepherd Street / 2 & 5 Atkinson Streets, Liverpool, NSW. Based on information provided to date and the nominated architectural drawings (issued 04/11/2015) the following outcome has been achieved.

### Design Target

Based on the relevant Local Environmental Plan, Development Control Plan (DCP) – Liverpool City Council and the National Construction Code of Australia (NCC), we understand that the project is required to demonstrate BASIX compliance in support of the application development approval.

### Building Sustainability Index (BASIX)

BASIX is implemented under the Environmental Planning and Assessment Act and applies to all residential dwelling types within NSW. BASIX forms both part of the development application and building certification process within the state of NSW.

BASIX sets water and greenhouse gas reduction targets relative to the NSW average benchmark for per person potable water consumption & greenhouse gas emissions within the residential sector. BASIX also sets the minimum performance levels for thermal comfort of the dwelling and replaces the NCC Energy Efficiency benchmarks within the state of NSW. Thermal comfort levels are assessed via a simulation method in accordance with the NatHERS House Energy Rating protocol.

### (NatHERS) Thermal Performance Software

Wood & Grieve Engineers have completed thermal comfort analysis utilising the NCC endorsed FirstRate5 software. The FirstRate5 assessment tool conducts predictive analysis of the thermal performance of a Class 1 or Class 2 facility. FirstRate5 assess proposed buildings fabric on energy loads for heating and cooling. The information required for the FirstRate5 assessment includes:-

- Floor Area
- Wall Layouts and Wall Types (including insulation ratings)
- Roof Layouts and Roof Types (including insulation ratings)
- Glazing Layouts and construction types
- Shading details
- Extent of building sealing devices (i.e. door seals, window seals etc.)

FirstRate5 does not include an assessment of building services plant efficiency, the embodied energy of materials or any renewable energy considerations.

# 20 Shepherd St, Liverpool

## Design Documentation

The following assessment is based on all architectural drawings dated 04 November 2015 and specifications as noted above and received to date, including:

- A1001 Site Plan
- A2100 Basement 2
- A2101 Basement 1
- A2102 Ground Floor
- A2103 Level 01
- A2104 Level 2
- A2105 Level 3
- A2106 Level 4
- A2107 Level 5 Podium
- A2108 Level 6
- A2109 Level 07-08 Typical
- A2110 Level 09-10
- A2111 Level 11-15
- A2113 Roof
- A3101 North
- A3102 South West East
- A3201 North East West
- A3401 AA-BB
- A3405 CC-DD
- 14048-LA\_1 Landscaping Plan (ASPECT Studios)

***Note: Changes to the design drawings and specifications will affect the outcome of this assessment and potentially the certification of the proposed building works.***

# 20 Shepherd St, Liverpool

## 2 Thermal Comfort Design Assessment

### Thermal Comfort Design Assessment

The thermal comfort aspect of this assessment was conducted using the FirstRate5 Thermal Performance Assessment Software, which assesses the thermal performance of a Class 1 or Class 2 dwelling in accordance with the requirements as stated in the BASIX Thermal Comfort Protocol.

Compliance requires that the average area adjusted heating and cooling loads be below the average area adjusted heating and cooling loads calculated by BASIX.

Compliance also requires that the individual dwelling area adjusted heating and cooling loads be below the individual area adjusted heating and cooling loads calculated by BASIX.

Based on the information received to date from Woods Bagot, the development average area adjusted heating and cooling loads were found to be as noted in the table below.

20 Shepherd St, Liverpool	AREA ADJUSTED HEATING LOAD (MJ/m <sup>2</sup> )	AREA ADJUSTED COOLING LOAD (MJ/m <sup>2</sup> )
BASIX Maximum	74	70
Development Average	35.6	43.0

\*Note: A full summary of energy modelling has been provided within Appendix – A.

### Energy Modelling Limitations

*The energy modelling results obtained from the FirstRate5 software provides an estimate of the base building energy performance only. This estimate is based upon a simplified and idealised version of the building that does not fully comply with the intricacies of a building and its operation. As a result the energy model represents an interpretation of the potential building performance only. Several dependent factors will affect the actual operational performance of the building, including local climate variation, building occupant behaviour, construction technique and building services commissioning. No guarantee or warrantee of building performance in practice can be based on energy modelling results alone.*

# 20 Shepherd St, Liverpool

## 3 Design Specification – Building Fabric/Services

<b><u>Design Specification:</u></b>
<b><u>External Walls:</u></b> A minimum of R2.5 insulation added to Concrete External Walls to give a total R-Value of R2.8.
<b><u>Walls to Internal Corridor:</u></b> A minimum of R2.0 insulation to partition walls between apartments and corridors or non-conditioned internal zones.
<b><u>Internal Walls to Adjoining Apartment:</u></b> As the adjoining apartment is considered a conditioned space there is no thermal insulation requirement for this wall. Therefore the insulation to this wall shall be as per acoustic requirements.
<b><u>Ceilings:</u></b> We have assumed ceiling heights as indicated on the architectural drawings received (2700mm).
<b><u>Roof Type:</u></b> A minimum of R3.0 insulation to be added to all apartments below concrete roof or where there is an exposed concrete terrace/balcony area above (total R-value R3.2).
<b><u>Suspended Floor Slabs:</u></b> Add R1.0 insulation to underside of the ground level suspended slab only i.e. floor between conditioned spaces and basement car-parking below.
<b><u>Windows</u></b> <b>Fixed Glazing and Operable Windows:</b> The majority of fixed glazing and operable windows have been assumed to be equivalent to a single glazed unit with standard aluminium frames with a thermal performance. General Glazing Specification: <b>U-Value of 6.45 W/m<sup>2</sup>.K and an SHGC of 0.76 (Clear)</b> However, it should be noted that apartments G04, 809 and 810 in Building B require the following glazing specification: <b>U-Value of 4.63 W/m<sup>2</sup>.K and an SHGC of 0.7 (Single glazed unit with Low-E, Clear)</b> All windows above have been specified with weather-strips to prevent air infiltration when closed. This is standard compliance with AS2047. <b>Note:</b> <i>The thermal performance values for all windows detailed above are for glass and framing system combined.</i>
<b><u>Floor Coverings</u></b> The following floor finishes have been specified. Carpet to all bedrooms Timber floor boards to the living/Kitchen spaces; and Ceramic tiles to the bathrooms/wet areas.



# 20 Shepherd St, Liverpool

<p><b><u>Design Specification:</u></b></p>
<p><b><u>Air Leakage</u></b></p> <p>Kitchen Exhaust will be via a ducted range-hood to the external façade or roof.</p> <p>All bathrooms and ensuites exhaust to be via a ducted exhaust fan to external façade or roof.</p> <p>Back-draft dampers must be installed to prevent air infiltration.</p>
<p><b><u>Alternative Water Supply</u></b></p> <p><b>Rainwater tanks:</b></p> <p>A total rainwater harvesting system with a capacity of 20,000L is required in order to satisfy the project potable water demand reduction target. Rainwater collection shall be used for landscape irrigation supply only. Only non-trafficable roof areas have been designed as collection zones for the RWT.</p> <p>For additional stormwater or OSD requirements, please refer Civil engineer detail.</p>
<p><b><u>Hot Water System</u></b></p> <p>A centralised Gas hot water service has been specified within the BASIX Certificate.</p> <p>Domestic Hot Water pipework is required to have R0.6 insulation as per NCC requirements.</p>
<p><b><u>Swimming Pool</u></b></p> <p>No pool heating has been specified.</p>
<p><b><u>Mechanical Ventilation Systems:</u></b></p> <p><b>Common Areas:</b></p> <p>Car park – Ventilation Supply &amp; Exhaust with carbon monoxide monitor + VSD fan</p> <p>Garbage and Waste Rooms – Ventilation Exhaust Only</p> <p>Plant and Service Rooms – Ventilation Exhaust Only (thermostatically controlled)</p> <p>Stair/Storage – No Mechanical Ventilation</p> <p>Hallway/Lobbies – Ventilation Supply Only (time clock or BMS controlled)</p>
<p><b><u>Dwelling Air-Conditioning Systems:</u></b></p> <p>Reverse cycle air-conditioning (Single Phase) for all living zones and Master Bedrooms (3 bedroom apartments only)</p> <p>Minimum EER ratings – Cooling 3.0-3.5, Heating 3.0-3.5</p>
<p><b><u>Lighting:</u></b></p> <p><b>Common Areas:</b></p> <p>Compact Fluorescent with Motion Sensors</p> <p><b>Dwellings</b></p> <p>Dedicated Fluorescent or LED Lamps</p>
<p><b><u>Appliance Specifications:</u></b></p> <p>The following minimum energy performance specifications have been included within the BASIX assessment:</p> <p><b>Energy Star Ratings:</b></p>

## 20 Shepherd St, Liverpool

### **Design Specification:**

Gas cooktop and electric ovens to all dwellings.

Dishwasher – Min. 2.5 Star Energy Rating

Clothes Dryer – Min. 2.0 Star Energy Rating Specified

Clothes Washer – Not Specified

### **Water WELS ratings:**

Dishwasher – Min. 2 WELS rating

### **Fixtures & Fittings:**

We note that fixtures with the following WELS ratings have been included in the BASIX Assessment:

### **Common Areas (as applicable) & all dwellings:**

3 Star WELS rated Showerheads (>6.0 but ≤ 7.5 l/min),

4 Star WELS Toilets

5 Star WELS Kitchen taps

5 Star WELS Bathroom taps

We note a reduction in the quality of these appliances will affect the water aspect of the BASIX rating.

## 20 Shepherd St, Liverpool

### BASIX Certification Detail

Project Summary	
Project Name	The Paper Mills
Street Address	20 Shepherd Street, Liverpool, NSW
Local Government Area	Liverpool City Council
Plan Type / Number	DP247485
Lot No#	1
Section No#	-
No. of Residential Buildings	2
No. of units in Residential Flat Buildings	250
No. of multi-dwelling houses	-
No. of single dwelling houses	-
BASIX Certificate No#	581921M_04
Project Score	
Water	40%
Thermal Comfort	Pass
Energy	20%



## Appendix A – Energy Modelling

# 20 Shepherd St, Liverpool 2170

## FirstRate Energy Rating Assessment

### Preliminary Issue

JOB NO.27085-SYD-G

FirstRate5 Version: 5.1.11C

BUILDING	ENERGY INTENSITY ( MJ/m <sup>2</sup> )	AVERAGE STAR RATING
Building Average	79.06	4.4
Best Rating	30.70	8.7
Worst Rating	150.90	3.91

Level	Apt No.	Modelling Apt. Type	Area (m <sup>2</sup> )	Heating - MJ/m <sup>2</sup>	Cooling - MJ/m <sup>2</sup>	Energy Rating - MJ/m <sup>2</sup>
Ground Floor	G01A	Type_G01_A	111.50	29.6	68.7	98.3
	G02A	Type_G02_A	136.50	47.6	56.8	104.4
	G03A	Type_G03_A	92.00	56.9	25.4	82.3
	G04A	Type_G04_A	122.60	53.3	27.2	80.5
	G05A	Type_G08_A	89.50	66.6	28.3	94.9
	G06A	Type_G06_A	135.30	57.2	28.7	85.9
	G07A	Type_G07_A	107.90	64.6	27.2	91.8
	G08A	Type_G08_A	89.50	66.6	28.3	94.9
	G09A	Type_G09_A	89.50	73.3	28.4	101.7
	G10A	Type_G10_A	110.40	32.7	56.7	89.4
	G11A	Type_G11_A	99.60	46	43.8	89.8
	G12A	Type_G12_A	96.30	34.5	29.5	64
	G13A	Type_G13_A	127.60	23.4	38.9	62.3
	G01B	Type_G01_B	51.60	44.8	45.3	90.1
	G02B	Type_G02_B	50.20	51.1	44.2	95.3
	G03B	Type_G03_B	65.20	32.4	41.7	74.1
	G04B	Type_G04_B	166.50	21	63.8	84.8
	G05B	Type_G08_B	166.50	30.1	47.5	77.6
	G06B	Type_G06_B	105.40	40.3	49.4	89.7
	G07B	Type_G07_B	105.40	45.3	41.2	86.5
	G08B	Type_G08_B	166.50	30.1	47.5	77.6
	G09B	Type_G09_B	135.80	52	57.8	109.8
	G10B	Type_G10_B	90.30	58	82	140
	G11B	Type_G11_B	50.40	30.4	41.4	71.8
	G12B	Type_G12_B	48.90	54.4	53.2	107.6
Level 01	101B	Type_101_B	51.60	48.7	43.5	92.2
	102B	Type_102_B	67.80	43.3	45	88.3
	103B	Type_103_B	65.20	42	51.8	93.8
	104B	Type_104_B	90.30	57.1	82.8	139.9
	105B	Type_105_B	70.10	17.1	38	55.1
	106B	Type_106_B	54.30	39.3	48.6	87.9
Level 2	209A	Type_4A_A	79.40	30.5	68.4	98.9
	210A	Type_4B_A	69.10	12.4	31.6	44
	211A	Type_4B_M_A	69.10	11.1	24.2	35.3
	212A	Type_4C_A	64.00	13.2	32.9	46.1
	213A	Type_2B_A	60.00	11.6	26	37.6
	214A	Type_4D_G_A	93.50	24.7	30.1	54.8
	201A	Type_2A_A	93.60	18.8	32.1	50.9
	202A	Type_4E_A	79.80	29.1	57.6	86.7
	203A	Type_4F_A	92.80	62.1	48.7	110.8
	204A	Type_4G_A	84.90	50.4	31.4	81.8
	205A	Type_4G_M_A	84.90	51.6	29.1	80.7
	206A	Type_4H_A	84.90	50.4	36	86.4
	207A	Type_4G_M_A	84.90	51.6	29.1	80.7
	208A	Type_4G_b_A	84.90	55.2	32.9	88.1
	201B	Type_101_B	51.60	48.7	43.5	92.2
	202B	Type_202_B	69.00	42.2	45.7	87.9
	203B	Type_103_B	65.20	42	51.8	93.8
	204B	Type_204_B	97.70	43.2	54.5	97.7
	205B	Type_205_B	78.80	36	30.9	66.9
	206B	Type_206_B	55.80	44.7	35.6	80.3
	207B	Type_206_B	55.80	44.7	35.6	80.3
	208B	Type_208_B	57.70	42.9	33.9	76.8
	209B	Type_209_B	80.10	84.4	66.5	150.9
	210B	Type_104_B	90.30	57.1	82.8	139.9
	211B	Type_211_B	70.10	17.9	41.2	59.1
	212B	Type_212_B	54.10	41	49	90
Level 3	309A	Type_4A_A	79.40	30.5	68.4	98.9
	310A	Type_4B_A	69.10	12.4	31.6	44
	311A	Type_4B_M_A	69.10	11.1	24.2	35.3
	312A	Type_4C_A	64.00	13.2	32.9	46.1
	313A	Type_4C_M_A	64.00	5.8	24.9	30.7
	314A	Type_4D_A	93.60	18.4	33.1	51.5
	301A	Type_4D_M_A	93.60	15.7	31	46.7
	302A	Type_4E_A	79.80	29.1	57.6	86.7
	303A	Type_4F_A	92.80	62.1	48.7	110.8
	304A	Type_4G_A	84.90	50.4	31.4	81.8
	305A	Type_4G_M_A	84.90	51.6	29.1	80.7
	306A	Type_4H_A	84.90	50.4	36	86.4
	307A	Type_4G_M_A	84.90	51.6	29.1	80.7
	308A	Type_4G_b_A	84.90	55.2	32.9	88.1
	301B	Type_101_B	51.60	48.7	43.5	92.2
	302B	Type_302_B	51.30	41.6	45.3	86.9
	303B	Type_303_B	85.00	35.1	55.3	90.4
	304B	Type_204_B	97.70	43.2	54.5	97.7
	305B	Type_205_B	78.80	36	30.9	66.9
	306B	Type_306_B	55.80	45.3	35.7	81
	307B	Type_306_B	55.80	45.3	35.7	81
	308B	Type_208_B	57.70	42.9	33.9	76.8

	309B	Type_209_B	80.10	84.4	66.5	150.9
	310B	Type_104_B	90.30	57.1	82.8	139.9
	311B	Type_211_B	70.10	17.9	41.2	59.1
	312B	Type_312_B	54.10	41.3	49	90.3
Level 4	401A	Type_4D_M_A	93.60	15.7	31	46.7
	402A	Type_4E_A	79.80	29.1	57.6	86.7
	403A	Type_4F_A	92.80	62.1	48.7	110.8
	404A	Type_4G_A	84.90	50.4	31.4	81.8
	405A	Type_4G_M_A	84.90	51.6	29.1	80.7
	406A	Type_4H_A	84.90	50.4	36	86.4
	407A	Type_4G_M_b_A	84.90	59	38.8	97.8
	408A	Type_4G_b_A	84.90	55.2	32.9	88.1
	409A	Type_4A_A	79.40	30.5	68.4	98.9
	410A	Type_4B_A	69.10	12.4	31.6	44
	411A	Type_4B_M_A	69.10	11.1	24.2	35.3
	412A	Type_4C_A	64.00	13.2	32.9	46.1
	413A	Type_4C_M_A	64.00	5.8	24.9	30.7
	414A	Type_4D_A	93.60	18.4	33.1	51.5
	401B	Type_101_B	51.60	48.7	43.5	92.2
	402B	Type_302_B	51.30	41.6	45.3	86.9
	403B	Type_303_B	85.00	35.1	55.3	90.4
	404B	Type_204_B	97.70	43.2	54.5	97.7
	405B	Type_205_B	78.80	36	30.9	66.9
	406B	Type_206_B	55.80	44.7	35.6	80.3
	407B	Type_206_B	55.80	44.7	35.6	80.3
	408B	Type_208_B	57.70	42.9	33.9	76.8
	409B	Type_209_B	80.10	84.4	66.5	150.9
	410B	Type_104_B	90.30	57.1	82.8	139.9
	411B	Type_211_B	70.10	17.9	41.2	59.1
	412B	Type_212_B	54.10	41	49	90
Level 5	501A	Type_5A_A	93.20	12.6	24.3	36.9
	502A	Type_5B_A	63.40	23.7	72.9	96.6
	503A	Type_5C_A	67.80	45.9	51.7	97.6
	504A	Type_N11F_A	79.50	33.4	26.8	60.2
	505A	Type_N11F_A	79.50	33.4	26.8	60.2
	506A	Type_5C_A	67.80	45.9	51.7	97.6
	507A	Type_5B_A	63.40	23.7	72.9	96.6
	508A	Type_5A_A	93.20	12.6	24.3	36.9
	501B	Type_101_B	51.60	48.7	43.5	92.2
	502B	Type_302_B	51.30	41.6	45.3	86.9
	503B	Type_303_B	85.00	35.1	55.3	90.4
	504B	Type_204_B	97.70	43.2	54.5	97.7
	505B	Type_205_B	78.80	36	30.9	66.9
	506B	Type_206_B	55.80	44.7	35.6	80.3
	507B	Type_206_B	55.80	44.7	35.6	80.3
	508B	Type_208_B	57.70	42.9	33.9	76.8
	509B	Type_209_B	80.10	84.4	66.5	150.9
	510B	Type_104_B	90.30	57.1	82.8	139.9
	511B	Type_211_B	70.10	17.9	41.2	59.1
	512B	Type_212_B	54.10	41	49	90
Level 6	601A	Type_N11C_A	86.80	9.7	21.1	30.8
	602A	Type_N11D_A	92.70	15.6	48	63.6
	603A	Type_N11E_A	92.70	35	49.3	84.3
	604A	Type_N11F_A	79.50	33.4	26.8	60.2
	605A	Type_N11F_A	79.50	33.4	26.8	60.2
	606A	Type_N11E_A	92.70	35	49.3	84.3
	607A	Type_N11D_A	92.70	15.6	48	63.6
	608A	Type_N11C_A	86.80	9.7	21.1	30.8
	601B	Type_101_B	51.60	48.7	43.5	92.2
	602B	Type_302_B	51.30	41.6	45.3	86.9
	603B	Type_303_B	85.00	35.1	55.3	90.4
	604B	Type_204_B	97.70	43.2	54.5	97.7
	605B	Type_205_B	78.80	36	30.9	66.9
	606B	Type_206_B	55.80	44.7	35.6	80.3
	607B	Type_206_B	55.80	44.7	35.6	80.3
	608B	Type_208_B	57.70	42.9	33.9	76.8
	609B	Type_209_B	80.10	84.4	66.5	150.9
	610B	Type_104_B	90.30	57.1	82.8	139.9
	611B	Type_211_B	70.10	17.9	41.2	59.1
	612B	Type_212_B	54.10	41	49	90
Level 7	701A	Type_N11C_A	86.80	9.7	21.1	30.8
	702A	Type_N11D_A	92.70	15.6	48	63.6
	703A	Type_N11E_A	92.70	35	49.3	84.3
	704A	Type_N11F_A	79.50	33.4	26.8	60.2
	705A	Type_N11F_A	79.50	33.4	26.8	60.2
	706A	Type_N11E_A	92.70	35	49.3	84.3
	707A	Type_N11D_A	92.70	15.6	48	63.6
	708A	Type_N11C_A	86.80	9.7	21.1	30.8
	701B	Type_101_B	51.60	48.7	43.5	92.2
	702B	Type_302_B	51.30	41.6	45.3	86.9
	703B	Type_303_B	85.00	35.1	55.3	90.4
	704B	Type_204_B	97.70	43.2	54.5	97.7
	705B	Type_205_B	78.80	36	30.9	66.9
	706B	Type_206_B	55.80	44.7	35.6	80.3
	707B	Type_206_B	55.80	44.7	35.6	80.3
	708B	Type_208_B	57.70	42.9	33.9	76.8
	709B	Type_209_B	80.10	84.4	66.5	150.9
	710B	Type_104_B	90.30	57.1	82.8	139.9
	711B	Type_211_B	70.10	17.9	41.2	59.1
	712B	Type_212_B	54.10	41	49	90
Level 8	801A	Type_N11C_A	86.80	9.7	21.1	30.8
	802A	Type_N11D_A	92.70	15.6	48	63.6
	803A	Type_N11E_A	92.70	35	49.3	84.3
	804A	Type_N11F_A	79.50	33.4	26.8	60.2
	805A	Type_N11F_A	79.50	33.4	26.8	60.2
	806A	Type_N11E_A	92.70	35	49.3	84.3
	807A	Type_N11D_A	92.70	15.6	48	63.6
	808A	Type_N11C_A	86.80	9.7	21.1	30.8
	801B	Type_801_B	51.60	63.3	56.5	119.8
	802B	Type_802_B	51.30	55.7	57.8	113.5
	803B	Type_803_B	85.00	48.4	72.3	120.7
	804B	Type_804_B	79.70	52.8	69.3	122.1
	805B	Type_805_B	78.80	47.1	41.6	88.7
	806B	Type_806_B	55.80	54.7	47.1	101.8

	807B	Type_806_B	55.80	54.7	47.1	101.8
	808B	Type_808_B	57.70	53.1	45.6	98.7
	809B	Type_809_B	80.10	75.7	56.9	132.6
	810B	Type_810_B	90.30	58.5	70.8	129.3
	811B	Type_811_B	70.10	33.3	53.9	87.2
	812B	Type_812_B	54.10	59.4	60.2	119.6
Level 9	901	Type_N11C_A	86.80	9.7	21.1	30.8
	902	Type_N11D_A	92.70	15.6	48	63.6
	903	Type_N11E_A	92.70	35	49.3	84.3
	904	Type_N11F_A	79.50	33.4	26.8	60.2
	905	Type_N11F_A	79.50	33.4	26.8	60.2
	906	Type_N11E_A	92.70	35	49.3	84.3
	907	Type_N11D_A	92.70	15.6	48	63.6
	908	Type_N11C_A	86.80	9.7	21.1	30.8
Level 10	1001	Type_N11C_A	86.80	9.7	21.1	30.8
	1002	Type_N11D_A	92.70	15.6	48	63.6
	1003	Type_N11E_A	92.70	35	49.3	84.3
	1004	Type_N11F_A	79.50	33.4	26.8	60.2
	1005	Type_N11F_A	79.50	33.4	26.8	60.2
	1006	Type_N11E_A	92.70	35	49.3	84.3
	1007	Type_N11D_A	92.70	15.6	48	63.6
	1008	Type_N11C_A	86.80	9.7	21.1	30.8
Level 11	1101	Type_N11C_A	86.80	9.7	21.1	30.8
	1102	Type_N11D_A	92.70	15.6	48	63.6
	1103	Type_N11E_A	92.70	35	49.3	84.3
	1104	Type_N11F_A	79.50	33.4	26.8	60.2
	1105	Type_N11F_A	79.50	33.4	26.8	60.2
	1106	Type_N11E_A	92.70	35	49.3	84.3
	1107	Type_N11A_A	52.50	25.1	66.2	91.3
	1108	Type_N11B_A	35.60	7.8	28.6	36.4
	1109	Type_N11C_A	86.80	9.7	21.1	30.8
Level 12	1201	Type_N11C_A	86.80	9.7	21.1	30.8
	1202	Type_N11D_A	92.70	15.6	48	63.6
	1203	Type_N11E_A	92.70	35	49.3	84.3
	1204	Type_N11F_A	79.50	33.4	26.8	60.2
	1205	Type_N11F_A	79.50	33.4	26.8	60.2
	1206	Type_N11E_A	92.70	35	49.3	84.3
	1207	Type_N11A_A	52.50	25.1	66.2	91.3
	1208	Type_N11B_A	35.60	7.8	28.6	36.4
	1209	Type_N11C_A	86.80	9.7	21.1	30.8
Level 13	1301	Type_N11C_A	86.80	9.7	21.1	30.8
	1302	Type_N11D_A	92.70	15.6	48	63.6
	1303	Type_N11E_A	92.70	35	49.3	84.3
	1304	Type_N11F_A	79.50	33.4	26.8	60.2
	1305	Type_N11F_A	79.50	33.4	26.8	60.2
	1306	Type_N11E_A	92.70	35	49.3	84.3
	1307	Type_N11A_A	52.50	25.1	66.2	91.3
	1308	Type_N11B_A	35.60	7.8	28.6	36.4
	1309	Type_N11C_A	86.80	9.7	21.1	30.8
Level 14	1401	Type_N11C_A	86.80	9.7	21.1	30.8
	1402	Type_N11D_A	92.70	15.6	48	63.6
	1403	Type_N11E_A	92.70	35	49.3	84.3
	1404	Type_N11F_A	79.50	33.4	26.8	60.2
	1405	Type_N11F_A	79.50	33.4	26.8	60.2
	1406	Type_N11E_A	92.70	35	49.3	84.3
	1407	Type_N11A_A	52.50	25.1	66.2	91.3
	1408	Type_N11B_A	35.60	7.8	28.6	36.4
	1409	Type_N11C_A	86.80	9.7	21.1	30.8
Level 15	1501	Type_N11C_A_R	86.80	13.1	26.5	39.6
	1502	Type_N11D_A_R	92.70	19.3	60.8	80.1
	1503	Type_N11E_A_R	92.70	38.4	59.4	97.8
	1504	Type_N11F_A_R	79.50	34.4	31.7	66.1
	1505	Type_N11F_A_R	79.50	34.4	31.7	66.1
	1506	Type_N11E_A_R	92.70	38.4	59.4	97.8
	1507	Type_N11A_A_R	52.50	32.1	78.3	110.4
	1508	Type_N11B_A_R	35.60	11.1	36	47.1
	1509	Type_N11C_A_R	86.80	13.1	26.5	39.6



## Appendix B – BASIX Certificate

# BASIX<sup>®</sup>Certificate

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

## Multi Dwelling

Certificate number: 581921M\_04




This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 18/09/2014 published by Planning & Infrastructure. This document is available at [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)

Director-General

Date of issue: Wednesday, 11 November 2015

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



Project summary		
Project name	20 Shepherd st_04	
Street address	20 Shepherd Street Liverpool 2170	
Local Government Area	Liverpool City Council	
Plan type and plan number	deposited 247485	
Lot no.	1	
Section no.	-	
No. of residential flat buildings	2	
No. of units in residential flat buildings	250	
No. of multi-dwelling houses	0	
No. of single dwelling houses	0	
Project score		
Water	 40	Target 40
Thermal Comfort	 Pass	Target Pass
Energy	 20	Target 20

### Certificate Prepared by

Name / Company Name: Wood & Grieve Engineers

ABN (if applicable): 97137999609

# Description of project

## Project address

Project name	20 Shepherd st_04
Street address	20 Shepherd Street Liverpool 2170
Local Government Area	Liverpool City Council
Plan type and plan number	deposited 247485
Lot no.	1
Section no.	-

## Project type

No. of residential flat buildings	2
No. of units in residential flat buildings	250
No. of multi-dwelling houses	0
No. of single dwelling houses	0

## Site details

Site area (m²)	9873
Roof area (m²)	1464
Non-residential floor area (m²)	0
Residential car spaces	280
Non-residential car spaces	0

## Common area landscape

Common area lawn (m²)	0
Common area garden (m²)	3130.6
Area of indigenous or low water use species (m²)	0

## Assessor details

Assessor number	VIC/13/1513
Certificate number	15130019
Climate zone	28

## Project score

Water	✓ 40	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 20	Target 20

## Description of project

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

### Residential flat buildings - Building1-North end, 148 dwellings, 16 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> )
201A	1	93.0	0.0	0	0
205A	2	84.0	0.0	0	0
209A	2	79.0	0.0	0	0
213A	1	60.0	0.0	0	0
303A	2	92.0	0.0	0	0
307A	2	84.0	0.0	0	0
311A	1	69.0	0.0	0	0
401A	2	93.0	0.0	0	0
405A	2	84.0	0.0	0	0
409A	2	79.0	0.0	0	0
413A	1	64.0	0.0	0	0
503A	2	67.0	0.0	0	0
507A	1	63.0	0.0	0	0
603A	2	92.0	0.0	0	0
607A	2	92.0	0.0	0	0
703A	2	92.0	0.0	0	0
707A	2	92.0	0.0	0	0
803A	2	92.0	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> )
202A	2	79.0	0.0	0	0
206A	2	84.0	0.0	0	0
210A	1	69.0	0.0	0	0
214A	2	93.0	0.0	0	0
304A	2	84.0	0.0	0	0
308A	2	84.0	0.0	0	0
312A	1	64.0	0.0	0	0
402A	2	79.0	0.0	0	0
406A	2	84.0	0.0	0	0
410A	1	69.0	0.0	0	0
414A	2	93.0	0.0	0	0
504A	2	79.0	0.0	0	0
508A	2	93.0	0.0	0	0
604A	2	79.0	0.0	0	0
608A	2	86.0	0.0	0	0
704A	2	79.0	0.0	0	0
708A	2	86.0	0.0	0	0
804A	2	79.0	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> )
203A	2	92.0	0.0	0	0
207A	2	84.0	0.0	0	0
211A	1	69.0	0.0	0	0
301A	2	93.0	0.0	0	0
305A	2	84.0	0.0	0	0
309A	2	79.0	0.0	0	0
313A	1	64.0	0.0	0	0
403A	2	92.0	0.0	0	0
407A	2	84.0	0.0	0	0
411A	1	69.0	0.0	0	0
501A	2	93.0	0.0	0	0
505A	2	79.0	0.0	0	0
601A	2	86.0	0.0	0	0
605A	2	79.0	0.0	0	0
701A	2	86.0	0.0	0	0
705A	2	79.0	0.0	0	0
801A	2	86.0	0.0	0	0
805A	2	79.0	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> )
204A	2	84.0	0.0	0	0
208A	2	84.0	0.0	0	0
212A	1	64.0	0.0	0	0
302A	2	79.0	0.0	0	0
306A	2	84.0	0.0	0	0
310A	1	69.0	0.0	0	0
314A	2	93.0	0.0	0	0
404A	2	84.0	0.0	0	0
408A	2	84.0	0.0	0	0
412A	2	64.0	0.0	0	0
502A	1	63.0	0.0	0	0
506A	2	67.0	0.0	0	0
602A	2	92.0	0.0	0	0
606A	2	92.0	0.0	0	0
702A	2	92.0	0.0	0	0
706A	2	92.0	0.0	0	0
802A	2	92.0	0.0	0	0
806A	2	92.0	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> )
807A	2	92.0	0.0	0	0
903A	2	92.0	0.0	0	0
907A	2	92.0	0.0	0	0
G03A	2	92.0	0.0	0	0
G07A	2	107.0	0.0	0	0
G11A	2	99.0	0.0	0	0
1002A	2	92.0	0.0	0	0
1006A	2	92.0	0.0	0	0
1102A	2	92.0	0.0	0	0
1106A	2	92.0	0.0	0	0
1201A	2	86.0	0.0	0	0
1205A	2	79.0	0.0	0	0
1209A	2	86.0	0.0	0	-
1304A	2	79.0	0.0	0	0
1308A	1	35.0	0.0	0	0
1403A	2	92.0	0.0	0	0
1407A	1	52.0	0.0	0	0
1502A	2	92.0	0.0	0	0
1506A	2	92.0	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> )
808A	2	86.0	0.0	0	0
904A	2	79.0	0.0	0	0
908A	2	86.0	0.0	0	0
G04A	3	122.0	0.0	0	0
G08A	2	89.0	0.0	0	0
G12A	2	96.3	0.0	0	0
1003A	2	92.0	0.0	0	0
1007A	2	92.0	0.0	0	0
1103A	2	92.0	0.0	0	0
1107A	1	52.0	0.0	0	0
1202A	2	92.0	0.0	0	0
1206A	2	92.0	0.0	0	0
1301A	2	86.0	0.0	0	0
1305A	2	79.0	0.0	0	0
1309A	2	86.0	0.0	0	0
1404A	2	79.0	0.0	0	0
1408A	1	35.0	0.0	0	0
1503A	2	92.0	0.0	0	0
1507A	1	52.0	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> )
901A	2	86.0	0.0	0	0
905A	2	79.0	0.0	0	0
G01A	2	111.0	0.0	0	0
G05A	2	89.0	0.0	0	0
G09A	2	89.0	0.0	0	0
G13A	3	127.0	0.0	0	0
1004A	2	79.0	0.0	0	0
1008A	2	86.0	0.0	0	0
1104A	2	79.0	0.0	0	0
1108A	1	35.0	0.0	0	0
1203A	2	92.0	0.0	0	0
1207A	1	52.0	0.0	0	0
1302A	2	92.0	0.0	0	0
1306A	2	92.0	0.0	0	0
1401A	2	86.0	0.0	0	0
1405A	2	79.0	0.0	0	0
1409A	2	86.0	0.0	0	0
1504A	2	79.0	0.0	0	0
1508A	1	35.0	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> )
902A	2	92.0	0.0	0	0
906A	2	92.0	0.0	0	0
G02A	3	136.0	0.0	0	0
G06A	3	135.0	0.0	0	0
G10A	2	110.0	0.0	0	0
1001A	2	86.0	0.0	0	0
1005A	2	79.0	0.0	0	0
1101A	2	86.0	0.0	0	0
1105A	2	79.0	0.0	0	0
1109A	2	86.0	0.0	0	0
1204A	2	79.0	0.0	0	0
1208A	1	35.0	0.0	0	0
1303A	2	92.0	0.0	0	0
1307A	1	52.0	0.0	0	0
1402A	2	92.0	0.0	0	0
1406A	2	92.0	0.0	0	0
1501A	2	86.0	0.0	0	0
1505A	2	79.0	0.0	0	0
1509A	2	86.0	0.0	0	0

### Residential flat buildings - Building2-South end, 102 dwellings, 9 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> )
101B	1	51.0	0.0	0	0
105B	2	70.0	0.0	0	0
203B	2	65.0	0.0	0	0
207B	1	55.0	0.0	0	0
211B	2	70.0	0.0	0	0
303B	2	85.0	0.0	0	0
307B	1	55.0	0.0	0	0
311B	2	70.0	0.0	0	0
403B	2	85.0	0.0	0	0
407B	1	55.0	0.0	0	0
411B	2	70.0	0.0	0	0
503B	2	85.0	0.0	0	0
507B	1	55.0	0.0	0	0
511B	2	70.0	0.0	0	0
603B	2	85.0	0.0	0	0
607B	1	55.0	0.0	0	0
611B	2	70.0	0.0	0	0
703B	2	85.0	0.0	0	0
707B	1	55.0	0.0	0	0
711B	2	70.0	0.0	0	0
803B	2	85.0	0.0	0	0
807B	1	55.0	0.0	0	0
811B	2	70.0	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> )
102B	2	67.0	0.0	0	0
106B	1	54.0	0.0	0	0
204B	2	97.0	0.0	0	0
208B	1	57.0	0.0	0	0
212B	1	54.0	0.0	0	0
304B	2	97.0	0.0	0	0
308B	1	57.0	0.0	0	0
312B	1	54.0	0.0	0	0
404B	2	97.0	0.0	0	0
408B	1	57.0	0.0	0	0
412B	1	54.0	0.0	0	0
504B	2	97.0	0.0	0	0
508B	1	57.0	0.0	0	0
512B	1	54.0	0.0	0	0
604B	2	97.0	0.0	0	0
608B	1	57.0	0.0	0	0
612B	1	54.0	0.0	0	0
704B	2	97.0	0.0	0	0
708B	1	57.0	0.0	0	0
712B	1	54.0	0.0	0	0
804B	2	79.0	0.0	0	0
808B	1	57.0	0.0	0	0
812B	1	54.0	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> )
103B	2	65.0	0.0	0	0
201B	1	51.0	0.0	0	0
205B	2	78.0	0.0	0	0
209B	2	80.0	0.0	0	0
301B	1	51.0	0.0	0	0
305B	2	78.0	0.0	0	0
309B	2	80.0	0.0	0	0
401B	1	51.0	0.0	0	0
405B	2	78.0	0.0	0	0
409B	2	80.0	0.0	0	0
501B	1	51.0	0.0	0	0
505B	2	78.0	0.0	0	0
509B	2	80.0	0.0	0	0
601B	1	51.0	0.0	0	0
605B	2	78.0	0.0	0	0
609B	2	80.0	0.0	0	0
701B	1	51.0	0.0	0	0
705B	2	78.0	0.0	0	0
709B	2	80.0	0.0	0	0
801B	1	51.0	0.0	0	0
805B	2	78.0	0.0	0	0
809B	2	80.0	0.0	0	0
G01B	1	51.0	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> )
104B	2	90.0	0.0	0	0
202B	2	69.0	0.0	0	0
206B	1	55.0	0.0	0	0
210B	2	90.0	0.0	0	0
302B	1	51.0	0.0	0	0
306B	1	55.0	0.0	0	0
310B	2	90.0	0.0	0	0
402B	1	51.0	0.0	0	0
406B	1	55.0	0.0	0	0
410B	2	90.0	0.0	0	0
502B	1	51.0	0.0	0	0
506B	1	55.0	0.0	0	0
510B	2	90.0	0.0	0	0
602B	1	51.0	0.0	0	0
606B	1	55.0	0.0	0	0
610B	2	90.0	0.0	0	0
702B	1	51.0	0.0	0	0
706B	1	55.0	0.0	0	0
710B	2	90.0	0.0	0	0
802B	1	51.0	0.0	0	0
806B	1	55.0	0.0	0	0
810B	2	90.0	0.0	0	0
G02B	1	50.0	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> )
G03B	2	65.0	0.0	0	0
G07B	3	105.0	0.0	0	0
G11B	1	50.0	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> )
G04B	3	166.0	0.0	0	0
G08B	3	166.0	0.0	0	0
G12B	1	48.0	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> )
G05B	3	166.0	0.0	0	0
G09B	3	135.0	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> )
G06B	3	105.0	0.0	0	0
G10B	2	90.0	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-North end

Common area	Floor area (m <sup>2</sup> )	Common area	Floor area (m <sup>2</sup> )	Common area	Floor area (m <sup>2</sup> )
Lift car (No. 1)	-	Lift car (No. 2)	-	Lift car (No. 3)	-

### Common areas of unit building - Building2-South end

Common area	Floor area (m <sup>2</sup> )	Common area	Floor area (m <sup>2</sup> )
Lift car (No. 4)	-	Lift car (No. 5)	-

### Common areas of the development (non-building specific)

Common area	Floor area (m <sup>2</sup> )	Common area	Floor area (m <sup>2</sup> )	Common area	Floor area (m <sup>2</sup> )
Car park area (B1)	4046	Car park area (B2)	4121	Car park area (B3)	4121
Garbage rooms	245.47	Plant or service room (No. 1)	460.45	Storage	3298
Stair area (combined)	1000.3	Ground floor lobby type	51.2	Hallway/lobby type (No. 1)/corridor	2391.46



# Schedule of BASIX commitments

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

### (a) Dwellings

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

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

- (i) Water
- (ii) Energy

## 2. Commitments for Residential flat buildings - Building2-South end

### (a) Dwellings

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

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

- (i) Water
- (ii) Energy

## 3. Commitments for multi-dwelling houses

## 4. Commitments for single dwelling houses

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

- (i) Water
- (ii) Energy

## Schedule of BASIX commitments

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

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

#### (a) Dwellings

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

	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
1209A	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	2 star	-	-	-	-	-	-	-

	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
1006A, 1007A, 1008A, 1101A, 1102A, 1103A, 1104A, 1105A, 1106A, 1107A, 1108A, 1109A, 1201A, 1202A, 1203A, 1204A, 1205A, 1206A, 1207A, 1208A, 1301A, 1302A, 1303A, 1304A, 1305A, 1306A, 1309A, 1409A, 1501A, 1502A, 1503A, 1504A, 1505A, 1506A, 1507A, 1508A, 1509A	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	2 star	-	-	-	-	-	-	-

	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
201A, 202A, 203A, 204A, 205A, 206A, 207A, 208A, 209A, 210A, 211A, 212A, 213A, 214A, 301A, 302A, 303A, 304A, 305A, 306A, 307A, 308A, 309A, 310A, 311A, 312A, 313A, 314A, 401A, 402A, 403A, 404A, 405A, 406A, 407A, 408A, 409A, 410A, 411A, 412A,	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	2 star	-	-	-	-	-	-	-

	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
413A, 414A, 501A, 502A, 503A, 504A, 505A, 506A, 507A, 508A, 601A, 602A, 603A, 604A, 605A, 606A, 607A, 608A, 701A, 702A, 703A, 704A, 705A, 706A, 707A, 708A, 801A, 802A, 803A, 804A, 805A, 806A, 807A, 808A, 901A, 902A, 903A, 904A, 905A, 906A,														

	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
907A, 908A, G01A, G02A, G03A, G04A, G05A, G06A, G07A, G08A, G09A, G10A, G11A, G12A, G13A, 1001A, 1002A, 1003A, 1004A, 1005A, 1307A, 1308A, 1401A, 1402A, 1403A, 1404A, 1405A, 1406A, 1407A, 1408A														

	Alternative water source								
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up	

(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: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓ ✓ ✓	✓
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	



	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
G02A, G04A, G06A, G13A	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5	-	3 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no
1109A, 1209A, 1309A, 1409A, 1509A	1-phase airconditioning EER 3.0 - 3.5	-	-	-	2	1	yes	yes	yes	yes	0	no
1301A, 1304A, 1401A, 1404A, 1501A, 1504A	1-phase airconditioning EER 3.0 - 3.5	-	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	2 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no

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
201A, 210A, 211A, 212A, 213A, 310A, 311A, 312A, 313A, 410A, 411A, 413A, 502A, 507A, 1107A, 1108A, 1207A, 1208A, 1307A, 1308A, 1407A, 1408A, 1507A, 1508A	1-phase airconditioning EER 3.0 - 3.5	-	1-phase airconditioning EER 3.0 - 3.5	-	1 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no

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
202A, 203A, 204A, 205A, 206A, 207A, 208A, 209A, 214A, 301A, 302A, 303A, 304A, 305A, 306A, 307A, 308A, 309A, 314A, 401A, 402A, 403A, 404A, 405A, 406A, 407A, 408A, 409A, 412A, 414A, 501A, 503A, 504A, 505A, 506A, 508A, 601A, 602A, 603A,	1-phase airconditioning EER 3.0 - 3.5	-	1-phase airconditioning EER 3.0 - 3.5	-	2 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/ toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
604A, 605A, 606A, 607A, 608A, 701A, 702A, 703A, 704A, 705A, 706A, 707A, 708A, 801A, 802A, 803A, 804A, 805A, 806A, 807A, 808A, 901A, 902A, 903A, 904A, 905A, 906A, 907A, 908A, G01A, G03A, G05A, G07A, G08A, G09A, G10A, G11A, G12A, 1001A,												

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
1002A, 1003A, 1004A, 1005A, 1006A, 1007A, 1008A, 1101A, 1102A, 1103A, 1104A, 1105A, 1106A, 1201A, 1202A, 1203A, 1204A, 1205A, 1206A, 1302A, 1303A, 1305A, 1306A, 1402A, 1403A, 1405A, 1406A, 1502A, 1503A, 1505A, 1506A												

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
1109A, 1209A, 1309A, 1409A, 1509A	-	-	-	-	gas cooktop & electric oven	-	yes	2.5 star	-	2 star	-	-

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
201A, 202A, 203A, 204A, 205A, 206A, 207A, 208A, 209A, 210A, 211A, 212A, 213A, 214A, 301A, 302A, 303A, 304A, 305A, 306A, 307A, 308A, 309A, 310A, 311A, 312A, 313A, 314A, 401A, 402A, 403A, 404A, 405A, 406A, 407A, 408A, 409A, 410A,	-	-	-	-	gas cooktop & electric oven	-	yes	2.5 star	-	2 star	-	-

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
411A, 412A, 413A, 414A, 501A, 502A, 503A, 504A, 505A, 506A, 507A, 508A, 601A, 602A, 603A, 604A, 605A, 606A, 607A, 608A, 701A, 702A, 703A, 704A, 705A, 706A, 707A, 708A, 801A, 802A, 803A, 804A, 805A, 806A, 807A, 808A, 901A, 902A,												



	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
903A, 904A, 905A, 906A, 907A, 908A, G01A, G02A, G03A, G04A, G05A, G06A, G07A, G08A, G09A, G10A, G11A, G12A, G13A, 1001A, 1002A, 1003A, 1004A, 1005A, 1006A, 1007A, 1008A, 1101A, 1102A, 1103A, 1104A, 1105A, 1106A, 1107A, 1108A, 1201A, 1202A, 1203A,												

	Individual pool		Individual spa		Appliances & other efficiency measures							
Dwelling no.	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
1204A, 1205A, 1206A, 1207A, 1208A, 1301A, 1302A, 1303A, 1304A, 1305A, 1306A, 1307A, 1308A, 1401A, 1402A, 1403A, 1404A, 1405A, 1406A, 1407A, 1408A, 1501A, 1502A, 1503A, 1504A, 1505A, 1506A, 1507A, 1508A												

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development.			
(b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
(c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.			
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.			
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.			
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✓	✓
(g) Where there is an in-slab heating or cooling system, the applicant must:  (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✓	✓	✓
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✓	✓	✓

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m <sup>2</sup> /yr)	Area adjusted cooling load (in mJ/m <sup>2</sup> /yr)
201A	18.8	32.1
207A	51.6	21.9
211A	11.1	24.2
213A	11.6	26
214A	24.7	30.1

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
407A	59	38.8
G01A	29.6	68.7
G02A	47.6	56.8
G03A	56.9	25.4
G04A	53.3	27.2
G05A	66.6	28.3
G06A	57.2	28.7
G07A	64.6	27.2
G08A	66.6	28.7
G09A	73.3	28.4
G10A	32.7	56.7
G11A	46	43.8
G12A	45.6	39.9
G13A	23.4	38.9
1502A	19.3	60.8
1507A	32.1	78.3
1508A	11.1	36
301A, 401A	15.7	31
311A, 411A	12.9	30.9
313A, 413A	5.8	24.9
314A, 414A	18.4	33.1
501A, 508A	12.6	24.3
502A, 507A	23.7	72.9
503A, 506A	45.9	51.7
1501A, 1509A	13.1	26.5
1503A, 1506A	38.4	59.4
1504A, 1505A	34.4	31.7

	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)
202A, 302A, 402A	29.1	57.6
203A, 303A, 403A	62.1	48.7
204A, 304A, 404A	50.4	31.4
206A, 306A, 406A	50.4	36
208A, 308A, 408A	55.2	32.9
209A, 309A, 409A	30.5	68.4
210A, 310A, 410A	12.4	31.6
212A, 312A, 412A	13.2	32.9
205A, 305A, 307A, 405A	51.6	29.1
1107A, 1207A, 1307A, 1407A	25.1	66.2
1108A, 1208A, 1308A, 1408A	7.8	28.6
602A, 607A, 702A, 707A, 802A, 807A, 902A, 907A, 1002A, 1007A, 1102A, 1202A, 1302A, 1402A	15.6	48
601A, 608A, 701A, 708A, 801A, 808A, 901A, 908A, 1001A, 1008A, 1101A, 1109A, 1201A, 1209A, 1301A, 1309A, 1401A, 1409A	9.7	21.1
603A, 606A, 703A, 706A, 803A, 806A, 903A, 906A, 1003A, 1006A, 1103A, 1106A, 1203A, 1206A, 1303A, 1306A, 1403A, 1406A	35	49.3
All other dwellings	33.4	26.8

**(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.		✓	✓

<b>Common area</b>	<b>Showerheads rating</b>	<b>Toilets rating</b>	<b>Taps rating</b>	<b>Clothes washers rating</b>
All common areas	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

<b>Central systems</b>	<b>Size</b>	<b>Configuration</b>	<b>Connection (to allow for...)</b>
Pool (No. 1)	Volume: 97 kLs	Location: Building1-North end Pool shaded: no	-

<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	Common area ventilation system		Common area lighting		
	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Lift car (No. 1)	-	-	light-emitting diode	connected to lift call button	Yes
Lift car (No. 2)	-	-	light-emitting diode	connected to lift call button	Yes
Lift car (No. 3)	-	-	light-emitting diode	connected to lift call button	Yes

Central energy systems	Type	Specification
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 8
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 18
Lift (No. 3)	gearless traction with V V V F motor	Number of levels (including basement): 12
Pool (No. 1)	Heating source: no heating	Solar collector area (minimum, in square metres): 0 Pump controlled by timer: yes

## 2. Commitments for Residential flat buildings - Building2-South end

### (a) Dwellings

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



	Fixtures					Appliances		Individual pool				Individual spa		
Dwelling no.	All shower-heads	All toilet flushing systems	All kitchen taps	All bathroom taps	HW recirculation or diversion	All clothes washers	All dish-washers	Volume (max volume)	Pool cover	Pool location	Pool shaded	Volume (max volume)	Spa cover	Spa shaded
All dwellings	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	5 star	no	-	2 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
None	-	-	-	-	-	-	-	-

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

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.	✓	✓	✓
(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must: (aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and (bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.		✓ ✓	
(h) The applicant must install in the dwelling: (aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances & other efficiency measures" column of the table below; (bb) each appliance for which a rating is specified for that dwelling in the "Appliances & other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and (cc) any clothes drying line specified for the dwelling in the "Appliances & other efficiency measures" column of the table.		✓ ✓ ✓	✓
(i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".		✓	

	Hot water	Bathroom ventilation system		Kitchen ventilation system		Laundry ventilation system	
Dwelling no.	Hot water system	Each bathroom	Operation control	Each kitchen	Operation control	Each laundry	Operation control
All dwellings	central hot water system 1	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off	individual fan, ducted to façade or roof	manual switch on/off

Dwelling no.	Cooling		Heating		Artificial lighting						Natural lighting	
	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
G07B, G08B	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	3 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no
G11B, G12B	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no
G04B, G05B, G06B, G09B	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	1-phase airconditioning EER 3.0 - 3.5 (zoned)	-	3 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no

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
102B, 105B, 202B, 203B, 205B, 209B, 210B, 211B, 303B, 304B, 305B, 309B, 310B, 311B, 403B, 404B, 405B, 409B, 410B, 411B, 503B, 504B, 505B, 509B, 510B, 511B, 603B, 604B, 605B, 609B, 610B, 611B, 703B, 704B, 705B, 709B, 710B, 711B, 803B,	1-phase airconditioning EER 3.0 - 3.5	-	1-phase airconditioning EER 3.0 - 3.5	-	2 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no

	Cooling		Heating		Artificial lighting						Natural lighting	
Dwelling no.	living areas	bedroom areas	living areas	bedroom areas	No. of bedrooms &/or study	No. of living &/or dining rooms	Each kitchen	All bathrooms/toilets	Each laundry	All hallways	No. of bathrooms &/or toilets	Main kitchen
804B, 805B, 809B, 810B, 811B, G03B, G10B												

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
101B, 103B, 104B, 106B, 201B, 204B, 206B, 207B, 208B, 212B, 301B, 302B, 306B, 307B, 308B, 312B, 401B, 402B, 406B, 407B, 408B, 412B, 501B, 502B, 506B, 507B, 508B, 512B, 601B, 602B, 606B, 607B, 608B, 612B, 701B, 702B, 706B, 707B, 708B,	1-phase airconditioning EER 3.0 - 3.5	-	1-phase airconditioning EER 3.0 - 3.5	-	1 (dedicated)	1 (dedicated)	yes	yes	yes	yes	0	no

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
712B, 801B, 802B, 806B, 807B, 808B, 812B, G01B, G02B												

Dwelling no.	Individual pool		Individual spa		Appliances & other efficiency measures							
	Pool heating system	Timer	Spa heating system	Timer	Kitchen cooktop/oven	Refrigerator	Well ventilated fridge space	Dishwasher	Clothes washer	Clothes dryer	Indoor or sheltered clothes drying line	Private outdoor or unsheltered clothes drying line
All dwellings	-	-	-	-	gas cooktop & electric oven	-	yes	2.5 star	-	2 star	-	-

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

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.			
(e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.			
(f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.		✓	✓
(g) Where there is an in-slab heating or cooling system, the applicant must:  (aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or (bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.	✓	✓	✓
(h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.	✓	✓	✓

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m <sup>2</sup> /yr)	Area adjusted cooling load (in mJ/m <sup>2</sup> /yr)
102B	43.3	45
105B	17.1	38
106B	39.3	48.6
202B	42.2	45.7
312B	41.3	49
801B	63.3	56.5
802B	55.7	57.8
803B	48.4	72.3
804B	52.8	69.3
805B	47.1	41.6
808B	53.1	45.6



	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)
809B	75.7	56.9
810B	58.5	70.8
811B	33.3	53.9
812B	59.4	60.2
G01B	44.8	45.3
G02B	51.1	44.2
G03B	32.4	41.7
G04B	21	63.8
G06B	40.3	49.4
G07B	45.3	41.2
G09B	52	57.8
G10B	58	82
G11B	30.4	41.4
G12B	54.4	53.2
103B, 203B	42	51.8
306B, 307B	45.3	35.7
806B, 807B	54.7	47.1
G05B, G08B	30.1	47.5
212B, 412B, 512B, 612B, 712B	41	49
302B, 402B, 502B, 602B, 702B	41.6	45.3
303B, 403B, 503B, 603B, 703B	35.1	55.3
204B, 304B, 404B, 504B, 604B, 704B	43.2	54.5
205B, 305B, 405B, 505B, 605B, 705B	36	30.9
208B, 308B, 408B, 508B, 608B, 708B	42.9	33.9

	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)
209B, 309B, 409B, 509B, 609B, 709B	84.4	66.5
211B, 311B, 411B, 511B, 611B, 711B	17.9	41.2
101B, 201B, 301B, 401B, 501B, 601B, 701B	48.7	43.5
104B, 210B, 310B, 410B, 510B, 610B, 710B	57.1	82.8
All other dwellings	44.7	35.6

**(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.		✓	✓

<b>Common area</b>	<b>Showerheads rating</b>	<b>Toilets rating</b>	<b>Taps rating</b>	<b>Clothes washers rating</b>
All common areas	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

<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.		✓	✓
(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. 4)	-	-	light-emitting diode	connected to lift call button	Yes
Lift car (No. 5)	-	-	light-emitting diode	connected to lift call button	Yes

Central energy systems	Type	Specification
Lift (No. 4)	gearless traction with V V V F motor	Number of levels (including basement): 12
Lift (No. 5)	gearless traction with V V V F motor	Number of levels (including basement): 12

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

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

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

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star (> 6 but <= 7.5 L/min)	4 star	5 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central water tank - rainwater or stormwater (No. 1)	20000	To collect run-off from at least: - 1464 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 3130.6 square metres of common landscaped area on the site - car washing in 0 car washing bays on the site
Fire sprinkler system (No. 1)	-	-	-

(ii) Energy	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.		✓	✓
(b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified.		✓	✓
(c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.	✓	✓	✓

Common area	Common area ventilation system		Common area lighting		
	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Car park area (B1)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	compact fluorescent	motion sensors	Yes
Car park area (B2)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	compact fluorescent	motion sensors	Yes
Car park area (B3)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	compact fluorescent	motion sensors	Yes
Garbage rooms	ventilation exhaust only	-	compact fluorescent	manual on / manual off	No
Plant or service room (No. 1)	ventilation exhaust only	thermostatically controlled	compact fluorescent	manual on / manual off	No
Storage	no mechanical ventilation	-	light-emitting diode	manual on / manual off	No
Stair area (combined)	no mechanical ventilation	-	compact fluorescent	motion sensors	Yes
Ground floor lobby type	ventilation supply only	time clock or BMS controlled	light-emitting diode	time clock and motion sensors	Yes
Hallway/lobby type (No. 1)/corridor	ventilation supply only	time clock or BMS controlled	light-emitting diode	motion sensors	Yes

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas-fired boiler	Solar collector area (minimum, in square metres): 0 Piping insulation (ringmain & supply risers): (a) Piping external to building: R0.6 (~25 mm); (b) Piping internal to building: R0.6 (~25 mm)
Other	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).