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**Gazcorp Pty Ltd**

27-35 Punchbowl Road, Belfield

BASIX Assessment Report

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<b>Subject</b>	27-35 Punchbowl Road, Belfield – BASIX Assessment Report

## 1. SITE APPRECIATION

The proposed development is located at 27-35 Punchbowl Road, Belfield and consists of:

- 122 new residential units

## 2. BASIX WATER SECTION

The proposed development will meet the mandatory BASIX water target of 40% as long as the water commitments detailed in Table 1 are installed. For details of the requirements necessary to achieve this target, please refer to the BASIX Certificate No. 678913M\_05.

**Table 1: BASIX Water Commitments**

<b>Common Areas and Central Systems</b>	
<u>Area of Indigenous or low water species</u>	<ul style="list-style-type: none"> <li>• See Appendix B</li> </ul>
<u>Rainwater collection</u>	<ul style="list-style-type: none"> <li>• 95,800L rainwater tank</li> <li>• Roof collection area - 2953m<sup>2</sup></li> <li>• Rainwater to be used for Common areas landscape irrigation</li> </ul>
<u>Fire Sprinkler</u>	<ul style="list-style-type: none"> <li>• Test water to be diverted to a closed system</li> </ul>
<u>Fixtures for common areas</u>	<ul style="list-style-type: none"> <li>• 4-star (Water Rating) toilets</li> <li>• 5-star (Water Rating) taps</li> </ul>
<b>Private Dwellings</b>	
<u>Fixtures for apartments</u>	<ul style="list-style-type: none"> <li>• 3-star (Water Rating) showerheads with a flow rate &gt; 6.0L/min &amp; ≤ 7.5L/min</li> <li>• 4-star (Water Rating) toilets</li> <li>• 5-star (Water Rating) kitchen taps</li> <li>• 5-star (Water Rating) bathroom taps</li> <li>• 4-star (Water Rating) dishwasher</li> </ul>

## 3. BASIX THERMAL COMFORT SECTION

The thermal performance of the development has been evaluated using BERS Pro 2<sup>nd</sup> Generation software. The BERS Pro computer simulation of residential developments forms

part of the Nationwide House Energy Rating Scheme, and is used to assess the potential of a residential development to have low heating and cooling energy requirements once operational.

### 3.1 MODELLING ASSUMPTIONS

The “base-case” building fabric and glazing and associated thermal performance specifications are described in Table 2 below as these assumptions are based on the nominated preferred construction materials indicated by the architect.

**Note: Table 2 must be read in conjunction with Table 3 to Table 8. Table 3 to Table 8 outlines additional thermal enhancements / treatments to meet the mandatory thermal load targets to achieve compliance.**

**Table 2: Base Case Assumptions on Construction and Fabric**

Element	Material	Detail
External walls	Brick Veneer Fibre Cement Metal Cladding	Insulation: See Table 3
		Medium colour: 0.7<absorptance< 0.475
		Dark colour: Absorptance> 0.7
		Light colour: Absorptance< 0.475
Internal walls	Plasterboard	
Party walls	Power Panel	Neighbours
	Concrete block, lined	Common corridors
	Tilt concrete, lined	Fire stairs & lifts
Windows	6mm Single glazed, clear with Aluminium frame	Holland Blinds to all glazing except to bathrooms (BASIX Modelling Protocol, Developer is not obligated to install any curtains/blinds at CC Stage)
	Total Window System Properties:	U-value 6.57 & SHGC 0.74
	Window Operability	Balcony windows: 45% & 60% (i.e. sliding) as per plans & elevations Bedroom windows: 10% (BCA D2.24) All other non-balcony windows: 0% & 65% (i.e. fixed or awning)
Skylight	Single glazed, clear	
Roof	Concrete	Insulation: See Table 3
		Light colour: Absorptance< 0.475
Ceilings	Plasterboard	Insulation: See Table 3
Floors	Concrete	Insulation: See Table 3
		Carpet: Bedrooms only
		Tiles: Elsewhere
Common corridors naturally ventilated		Yes to Ground floor lobbies only.
Recessed downlights assessed		No

### 3.2 BERS PRO RESULTS (THERMAL COMFORT)

The simulated heating and cooling loads per dwelling are summarised in Table 3 to Table 8 below. Where the dwellings have failed to meet the thermal load targets additional thermal enhancements / treatments are provided. This is typically in the form of bulk insulation. These additional thermal treatments are required to pass the BASIX Thermal performance requirements.

**Table 3: BERS Pro Thermal Loads for Building A**

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
A401	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	42.0	12.3	5.5	Pass
A402	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	22.6	20.6	6.5	Pass
A403	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	33.0	14.2	6.0	Pass
A501	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	41.7	10.1	5.5	Pass
A502	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	21.2	14.7	7.0	Pass
A503	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	38.0	9.4	6.0	Pass
A601	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	45.7	9.7	5.5	Pass
A602	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	21.7	14.5	7.0	Pass
A603	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	37.1	11.4	6.0	Pass
A701	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	61.7	10.2	4.5	Pass
A702	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	22.0	11.9	7.0	Pass
A703	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	38.4	9.4	6.0	Pass
A801	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation to exposed areas only, Low-E pyrolytic glass of window properties U-value 4.7 & SHGC 0.63 to all windows	55.8	10.6	4.5	Pass
A802	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	62.8	54.6	3.0	Pass
A803	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	57.3	9.4	4.5	Pass

**Table 4: BERS Pro Thermal Loads for Building B**

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
B401	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	43.8	15.8	5.0	Pass
B402	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	18.6	14.7	7.0	Pass
B403	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	54.5	22.9	4.0	Pass
B501	R1.5 Bulk External Wall Insulation including walls	47.9	12.8	5.0	Pass

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
	adjacent to fire stairs & lifts				
B502	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	21.5	11.2	7.0	Pass
B503	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	58.7	18.9	4.0	Pass
B601	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	48.6	12.5	5.0	Pass
B602	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	21.8	11.2	7.0	Pass
B603	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	59.4	18.4	4.0	Pass
B701	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	48.7	12.3	5.0	Pass
B702	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	16.8	11.5	7.5	Pass
B703	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	58.2	17.7	4.0	Pass
B801	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation to exposed areas only, Low-E pyrolytic glass of window properties U-value 4.7 & SHGC 0.63 to all windows	52.9	10.8	5.0	Pass
B802	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation to exposed areas only	32.8	11.5	6.5	Pass
B803	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation to exposed areas only, Low-E pyrolytic glass of window properties U-value 4.7 & SHGC 0.63 to all windows	58.1	14.9	4.5	Pass

**Table 5: BERS Pro Thermal Loads for Building C**

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
C201	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridor, fire stairs & lifts, R2.0 Roof Insulation (exposed areas only), Low-E pyrolytic glass of window properties U-value 4.7 & SHGC 0.63 to all windows	57.0	14.4	4.5	Pass
C301	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	28.7	17.5	6.0	Pass
C302	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	44.0	12.8	5.5	Pass
C303	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	38.3	18.9	5.5	Pass
C401	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	36.2	18.4	5.5	Pass

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
C402	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	48.9	12.3	5.0	Pass
C403	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	35.5	18.1	5.5	Pass
C501	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	38.5	13.2	5.5	Pass
C502	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	51.4	10.2	5.0	Pass
C503	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	39.0	14.5	5.5	Pass
C601	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	58.4	14.5	4.5	Pass
C602	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation, Low-E pyrolytic glass of window properties U-value 4.7 & SHGC 0.63 to all windows, Skylight to be double glazed clear	58.4	40.0	3.5	Pass
C603	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	57.4	14.3	4.5	Pass

**Table 6: BERS Pro Thermal Loads for Building D**

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
D301	R1.0 Bulk Floor Insulation (adjacent to services areas only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	60.8	18.4	4.0	Pass
D302	R1.0 Bulk Floor Insulation (adjacent to services only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	43.4	20.4	5.0	Pass
D303	R1.0 Bulk Floor Insulation (adjacent to services only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	32.2	12.9	6.0	Pass
D304	R1.0 Bulk Floor Insulation (adjacent to services only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	50.4	14.5	5.0	Pass
D401	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	26.1	10.7	7.0	Pass
D402	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	25.5	21.2	6.0	Pass
D403	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	14.3	13.6	7.5	Pass

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
D404	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	32.5	15.8	6.0	Pass
D405	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	32.2	13.0	6.0	Pass
D406	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	29.6	14.1	6.5	Pass
D407	R1.0 Bulk Floor Insulation (adjacent to driveway only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	53.4	11.6	5.0	Pass
D501	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	28.7	9.1	7.0	Pass
D502	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation to exposed areas only	38.1	16.2	5.5	Pass
D503	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	15.3	10.7	8.0	Pass
D504	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	26.1	13.0	6.5	Pass
D505	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	35.6	11.2	6.0	Pass
D506	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	32.7	10.8	6.5	Pass
D507	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	34.6	10.6	6.0	Pass
D601	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	28.9	9.4	7.0	Pass
D602	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	43.7	19.0	5.0	Pass
D603	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	42.4	23.7	4.5	Pass
D604	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	29.7	9.4	6.5	Pass
D605	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	36.6	11.5	6.0	Pass
D606	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	34.2	11.1	6.0	Pass
D701	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	42.4	10.0	5.5	Pass
D702	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	53.5	19.9	4.5	Pass
D703	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	43.0	22.7	5.0	Pass
D704	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	29.9	9.3	6.5	Pass
D705	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	49.0	12.5	5.0	Pass
D706	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	50.7	12.6	5.0	Pass
D801	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation, Skylight to be double glazed clear	63.6	38.7	3.5	Pass
D802	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk	49.2	32.2	4.0	Pass



Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
	Roof Insulation				
D803	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	49.7	19.1	4.5	Pass
D804	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	34.6	20.4	5.5	Pass
D805	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation, Low-E pyrolytic glass of window properties U-value 4.7 & SHGC 0.63 to all windows	51.6	23.1	4.5	Pass

**Table 7: BERS Pro Thermal Loads for Building E**

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
E101	R1.0 Bulk Floor Insulation (adjacent to car park only), R2.0 Bulk External Wall Insulation including walls adjacent to common corridors, car park, fire stairs & lifts	61.4	22.7	4.0	Pass
E102	R1.5 Bulk Floor Insulation (adjacent to car park only), R2.0 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	65.4	12.1	4.0	Pass
E103	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, car park, fire stairs & lifts	52.2	11.7	5.0	Pass
E104	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	43.0	12.9	5.5	Pass
E201	R1.5 Bulk External Wall Insulation including walls adjacent to loading dock, fire stairs & lifts	25.8	17.9	6.5	Pass
E202	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	36.2	13.4	6.0	Pass
E203	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	19.0	18.3	7.0	Pass
E204	R1.5 Bulk External Wall Insulation including walls adjacent to loading dock, fire stairs & lifts	17.5	17.1	7.0	Pass
E301	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	22.5	18.4	6.5	Pass
E302	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs &	36.2	13.4	6.0	Pass



Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
	lifts				
E303	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	19.0	18.3	7.0	Pass
E304	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	19.9	17.8	7.0	Pass
E401	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	24.9	15.8	6.5	Pass
E402	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	32.9	16.4	6.0	Pass
E403	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	21.4	15.5	7.0	Pass
E404	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	22.5	15.7	7.0	Pass
E501	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	57.3	38.0	3.5	Pass
E502	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	31.7	23.9	5.5	Pass
E503	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	37.3	29.1	4.5	Pass
E504	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	40.3	14.0	5.5	Pass

**Table 8: BERS Pro Thermal Loads for Building F**

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
F101	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	51.4	14.0	5.0	Pass
F102	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	25.3	11.4	7.0	Pass
F103	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	22.9	13.8	7.0	Pass
F104	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	42.3	11.3	5.5	Pass

<b>Unit No.</b>	<b>Additional Treatments Required</b>	<b>Heating Load (MJ/m<sup>2</sup>.yr)</b>	<b>Cooling Load (MJ/m<sup>2</sup>.yr)</b>	<b>Stars</b>	<b>Pass/Fail</b>
F105	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to common corridors, fire stairs & lifts	32.1	9.0	6.5	Pass
F106	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	50.5	16.9	4.5	Pass
F201	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	28.2	15.8	6.5	Pass
F202	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	12.9	16.5	7.5	Pass
F203	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	11.2	15.6	7.5	Pass
F204	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	17.9	12.6	7.5	Pass
F205	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	11.2	10.7	8.0	Pass
F206	R1.0 Bulk Floor Insulation (adjacent to car park only), R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	39.5	13.6	5.5	Pass
F301	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	28.2	15.8	6.5	Pass
F302	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	12.9	16.5	7.5	Pass
F303	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	11.2	15.6	7.5	Pass
F304	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	17.9	12.6	7.5	Pass
F305	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	11.2	10.7	8.0	Pass
F306	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts	20.4	14.9	7.0	Pass
F401	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	49.2	14.5	5.0	Pass
F402	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	29.3	16.2	6.0	Pass
F403	R1.5 Bulk External Wall Insulation	55.9	40.1	3.5	Pass

Unit No.	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Stars	Pass/Fail
	including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation, Skylight to be double glazed opal				
F404	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation, Skylight to be double glazed opal	64.2	38.7	3.5	Pass
F405	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	31.2	11.6	6.5	Pass
F406	R1.5 Bulk External Wall Insulation including walls adjacent to fire stairs & lifts, R2.0 Bulk Roof Insulation	20.4	26.1	6.0	Pass

#### 4. BASIX ENERGY SECTION

The proposed development will meet the mandatory BASIX Energy target of 30% as long as the energy commitments detailed in Table 9 are installed.

**Table 9: BASIX Energy Commitments**

Component		Commitment
Common Areas and Central Systems	<u>Hot Water System</u>	<ul style="list-style-type: none"> <li>See Individual Systems</li> </ul>
	<u>Lifts</u>	<ul style="list-style-type: none"> <li>All lifts to use Gearless traction with VVVF motor servicing all levels</li> </ul>
	<u>Others</u>	<ul style="list-style-type: none"> <li>Building Management System (BMS) must be installed</li> </ul>
	<u>Ventilation</u>	<ul style="list-style-type: none"> <li>Car park: Ventilation (supply &amp; exhaust) with a CO monoxide monitor &amp; VSD fan</li> <li>Garbage Rooms: Ventilation (exhaust only), continuous</li> <li>Plant/Service Rooms: Ventilation (supply only), continuous</li> <li>Community room: No mechanical ventilation</li> <li>Other internal common areas: No mechanical ventilation</li> <li>Ground floor hallways &amp; lobbies: No mechanical ventilation</li> <li>Other hallways &amp; lobbies: Ventilation (supply only) connected to a time clock or BMS control</li> </ul>

<b>Component</b>		<b>Commitment</b>
	<u>Lighting</u>	<ul style="list-style-type: none"> <li>Car park: Fluorescent lighting with time clocks and motion sensors</li> <li>Lift Cars: Fluorescent lighting connected to lift call button</li> <li>Garbage Rooms: Fluorescent lighting with manual on/off switch</li> <li>Community room: Fluorescent lighting with manual on/off switch</li> <li>Plant/Service Room: Fluorescent lighting with manual on/off switch</li> <li>Other internal common area: Fluorescent lighting with manual on/off switch</li> <li>All Hallways &amp; lobbies: Compact Fluorescent lighting with motion sensors + time clock</li> </ul>
<b>Private Dwellings</b>	<u>Hot Water System</u>	<ul style="list-style-type: none"> <li>Individual Instantaneous Gas Hot Water System with 6 Stars Rating</li> </ul>
	<u>Ventilation</u>	<ul style="list-style-type: none"> <li>Kitchen Exhaust: Individual fan, not ducted, with manual on/off switch</li> <li>Bathroom Exhaust: Individual fan, ducted to roof or façade, interlocked to light switch</li> <li>Laundry Exhaust: Individual fan, ducted to roof or façade, with manual on/ timer off switch</li> </ul>
	<u>Heating &amp; Cooling</u>	<ul style="list-style-type: none"> <li>Heating: Living &amp; Beds to have individual 1-phase 3-star (new rating) air-conditioning</li> <li>Cooling: Living &amp; Beds to have individual 1 phase 2.5 star (new rating) air-conditioning</li> <li>Air conditioning to be <b>day-night zoned between bedrooms and living areas</b></li> </ul>
	<u>Lighting</u>	<ul style="list-style-type: none"> <li>At least 80% of light fittings (including the main light fitting) in all bedrooms, living, kitchen, bathrooms , laundries and hallways to use Fluorescent or LED lights with dedicated fittings<sup>1</sup></li> </ul>
	<u>Other</u>	<ul style="list-style-type: none"> <li>Gas cook top and electric oven</li> <li>Well-ventilated fridge space.</li> <li>Install a 3.5-star (Energy Rating) dishwasher</li> <li>Install a 2-star (Energy Rating) clothes dryer</li> <li>Install an indoor clothes drying line (e.g. line over bath or a screened line on balconies)</li> </ul>

## 5. CONCLUSION

The proposed development has been assessed to optimise its thermal performance (passive and fabric design) using the Nationwide House Energy Rating scheme (NatHERS) and also

<sup>1</sup> Definition of dedicated fittings is a light fitting that is only capable of accepting fluorescent or LED (Light Emitting Diode) lamps. It will not accept incandescent, halogen or any other non-fluorescent or non-LED lamps.

been assessed in terms of its ability to conserve water and minimise energy consumption through BASIX Tool.

With the commitment recommendations contained within this report the proposed development is able to meet BASIX requirements and is BASIX compliant.

For further details, please refer to the BASIX Certificate No. 678913M\_05 provided.

## APPENDIX A - ARCHITECTURAL DRAWINGS

The building sustainability performance assessment carried out in this report was based on the following architectural drawings supplied by Olsson & Associates Architects received on 31<sup>st</sup> October 2018.

DRAWING LIST			
DWG NO.	DRAWING NAME	SCALE	ISSUE
A-000	COVER SHEET	NTS	5
A-010	PROJECT SUMAMRY	NTS	5
A-110	SITE PLAN	1:500	5
A-180	EXISTING / DEMOLITION PLAN	1:200	NOT ISSUED
A-2B2	RL 8.00 PLAN - BASEMENT LEVEL 2	1:200	5
A-2B1	RL 11.00 PLAN - BASEMENT LEVEL 1	1:200	5
A-201	RL 14.00 PLAN - LOWER GROUND LEVEL	1:200	5
A-202	RL 17.00 PLAN - GROUND LEVEL	1:200	5
A-203	RL 20.00 PLAN - UPPER GROUND LEVEL	1:200	5
A-204	RL 23.00 PLAN - LEVEL 2	1:200	5
A-205	RL 26.00 PLAN - LEVEL 3	1:200	5
A-206	RL 29.00 PLAN - LEVEL 4	1:200	5
A-207	RL 32.00 PLAN - LEVEL 5	1:200	5
A-208	RL 35.00 PLAN - LEVEL 6	1:200	5
A-209	ROOF PLAN	1:200	5
A-250	ADAPTABLE APARTMENTS	1:100	5
A-301	NORTH / SOUTH ELEVATIONS	1:200	5
A-302	EAST / WEST ELEVATIONS	1:200	5
A-310	PRIVACY SCREENS	AS SHOWN	5
A-401	SECTIONS I	1:200	5
A-402	SECTIONS II	1:200	5
A-501	SCHEDULE OF MATERIALS & FINISHES	NTS	NOT ISSUED
A-701	PERSPECTIVES I	NTS	5
A-702	PERSPEVTIVES II	NTS	5
A-703	PERSPECTIVES III	NTS	NOT ISSUED
A-704	PERSPECTIVES IV	NTS	NOT ISSUED
A-801	SHADOW DIAGRAMS	NTS	5
A-820	MASSING COMPARISON DIAGRAM	NTS	5
A-850	GFA CALCULATIONS	1:500	5
A-851	SITE DIAGRAMS	1:500	NOT ISSUED
A-852	CROSS VENTILATION DIAGRAMS	1:500	5
A-853	SOLAR ACCESS DIAGRAMS	1:500	5

## APPENDIX B – LANDSCAPE AREAS

BASIX for Multi Dwellings - Landscape Checklist				
WATER - Central systems and common areas				
<b>Common area landscape</b> Please fill out mandatory fields marked in a *			Notes for assessor	
Number of Unit-Buildings	<input type="text" value="1"/>			
Building Name(s)	<input type="text" value="Building A-F"/>			
Common area of lawn (m²) *	<input type="text" value="85"/>			
Common area of garden (excluding lawn) (m²) *	<input type="text" value="935"/>			
Common area of indigenous species (m²) *	<input type="text" value="860"/>			
WATER - dwellings				
<b>Private area landscape</b> For each dwelling, gather the following information:			Notes for assessor	
How many units have private garden & lawn. Please list these separately below				
<input type="text" value="5"/>				
Unit No.	Total area of Private garden (m²)	Total area of Private lawn (m²)		Area of indigenous species (m²)
C201	96	45		40
F102	23.4	16.2		7.2
F103	27.5	17.9		5.3
F104	29.2	19.4		6.1
F105	37.9	15.7		17.7