

## Crown Prosha Joint Venture

### Eastlakes Shopping Centre Redevelopment



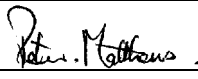
### BASIX Assessment



Report No. 20C-11-0069-TRP-265525-2

5<sup>th</sup> July 2012

## DOCUMENT CONTROL

Eastlakes Shopping Centre Redevelopment		
BASIX Assessment		
<b>REPORT NO:</b> 20C-11-0069-TRP-265525-2  <b>PREPARED FOR:</b> Crown Prosha Joint Venture Level 11 68 Alfred Street Milsons Point NSW Australia  <b>Contact:</b> Matthew Crews Phone:            9925 0088 Fax :                9925 0598	<b>LIBRARY CODE:</b>   <b>PREPARED BY:</b> Vipac Engineers & Scientists Ltd 2 Sirius Rd Lane Cove NSW 2066 AUSTRALIA  e: <a href="mailto:Sydney@vipac.com.au">Sydney@vipac.com.au</a> t: +61 2 9422 4222 f: +61 2 9420 5911	
<b>AUTHOR:</b>		
	Adriana Segovia	Date: 5th July 2012
	Project Engineer	
<b>REVIEWED BY:</b>		
	Henky Mantophani	Date: 5th July 2012
	Consulting Engineer	
<b>APPROVED BY:</b>		
	Peter Matthews	Date: 5th July 2012
	Operational Manager - NSW	
<b>REVISION HISTORY:</b>		
<b>Revision No.</b>	<b>Date Issued:</b>	<b>Reason/Comments:</b>
0	27 <sup>th</sup> April 2012	Initial Issue
1-2	5th July 2012	Updated Plans
<b>DISTRIBUTION:</b>		
<b>Copy No.</b> <u>  2  </u>		<b>Location</b>
1		Project
2	Uncontrolled Copy	Client (PDF Format)
<b>KEYWORDS:</b>	Crown Prosha Joint Venture, Eastlakes Shopping Centre Redevelopment, BASIX Assessment	

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## EXECUTIVE SUMMARY

VIPAC Engineers & Scientists Ltd. has been commissioned by Crown Prosha Joint Venture to assess the interaction of the proposed Eastlakes Shopping Centre Redevelopment development with the local environment in terms of BASIX compliance.

The proposed development comprises of:

- Basement car parking
- Ground Level Shopping Centre
- 82 serviced apartments and 361 residential apartments on top of the landscaped Podium

Dwellings within the development have been assessed in terms of their passive energy design using the Nationwide House Energy Rating scheme (NatHERS). They have also been assessed in terms of their ability to conserve water and also to minimise energy consumption via appliances and hot water etc. With the recommendations contained within this report we find that the proposed development is able to achieve a BASIX certificate.

While every endeavour has been made to provide a realistic energy rating for the proposed development, we note that the energy calculating process using computer program simulation is not 100% accurate.

The energy efficiency of any building is determined not only by the design but also by the energy consumption requirements and practices of the occupants. Actual energy consumption will not be known until a building is occupied and operational.



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## 1. INTRODUCTION

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

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

The energy section evaluates gas and electrical energy used for heating, cooling lighting, ventilation and appliances. The BASIX Energy target requires the development to uses less energy (ranging between 20% to 40% depending of development type and number of stories) than the NSW average.

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

## 2. BASIX WATER SECTION

The water efficiency performance of the development has been assessed using the online BASIX Tool. The assessment has considers Common Area and Central System features including the landscape design, plant species, water catchment areas, rain water tank size and efficiency of preferred fixtures and fittings in the dwellings.

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. 425799M\_02, 425840M\_02, 425860M\_02 AND 425857M\_02.

**Table 1: 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>1823.8 m<sup>2</sup></li> </ul>
<u>Rainwater collection</u>	<ul style="list-style-type: none"> <li>Minimum 30,000L rainwater tank</li> <li>Roof collection area – 9586.4 m<sup>2</sup></li> <li>Rainwater to be used for Common areas and private landscape irrigation and 2 carwash bays</li> </ul>
<u>Pool</u>	<ul style="list-style-type: none"> <li>2 swimming pools at approximately 104 kL and 338 kL</li> </ul>
<u>Fixtures</u>	<ul style="list-style-type: none"> <li>3-star (Water Rating) showerheads with a flow rate &gt; 6.0 L/min &amp; ≤ 7.5 L/min</li> </ul>

<b>Common Areas and Central Systems</b>	
	<ul style="list-style-type: none"> <li>• 4-star (Water Rating) toilets</li> <li>• 4-star (Water Rating) kitchen taps</li> </ul>
<u>Fire Sprinkler</u>	<ul style="list-style-type: none"> <li>• Test water must be diverted to a closed system</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; 6.0 L/min &amp; ≤ 7.5 L/min</li> <li>• 4-star (Water Rating) toilets</li> <li>• 4-star (Water Rating) kitchen taps</li> <li>• 4-star (Water Rating) bathroom taps</li> <li>• 4-star (Water Rating) dishwashers</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 following has been assumed for the thermal simulation:

- BERS Pro calculates the transient hourly heat gains and losses for each space inside a building taking into account the building's thermal storage, typical residential occupancy and operational profiles plus hourly weather data for the site
- Building geometry and orientation were modelled according to supplied drawings
- The area schedules used to determine heating and cooling loads (MJ/m<sup>2</sup>.yr) are contained in Appendix B
- The "base-case" building fabric and glazing and associated thermal performance specifications are described in Table 1 below: Note these assumptions are based on the nominated preferred construction materials indicated by the architect

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

<i>Element</i>	<i>Material</i>	<i>Detail</i>
External walls	Brick Veneer	<b>Insulation: See Table 2</b>
		Light colour: absorptance < 0.475
Internal walls	Plasterboard	
Party walls	Hebel	
Windows	6mm Single glazed, clear with Aluminium frame	Holland Blinds to all glazing except to bathrooms (BASIX Protocol, developer is not obligated to install the blinds during CC Stage)
	Total Window System Properties:	U-value 6.57 & SHGC 0.74
	Double glazed, clear with Aluminium frame to <b>Bedrooms in Building 1 only</b>	Holland Blinds to all glazing except to bathrooms (BASIX Protocol, developer is not obligated to install the blinds during CC Stage)
	Total Window System Properties:	U-value 4.27 & SHGC 0.67
Roof	Concrete and Metal Deck	Insulation: See Table 2
		Medium colour: 0.7 < absorptance < 0.475
Ceilings	Plasterboard	Insulation: See Table 2
Floors	Concrete	Tiles: Wet areas only
		Carpet: Elsewhere

### 3.2 BERS PRO RESULTS (THERMAL COMFORT)

The simulated heating and cooling loads per dwelling are summarised in Table 3 to Table 10 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 – Building 1**

<i>Unit No.</i>	<i>Repeated Units</i>	<i>Additional Treatments Required</i>	<i>Heating Load (MJ/m<sup>2</sup>.yr)</i>	<i>Cooling Load (MJ/m<sup>2</sup>.yr)</i>	<i>Max BASIX Heat Load (MJ/m<sup>2</sup>.yr)</i>	<i>Max BASIX Cool Load (MJ/m<sup>2</sup>.yr)</i>	<i>Pass/Fail</i>
001	009, 017, 025	None	25.9	24.5	66.0	59.0	Pass
002	010, 018, 026	None	27.6	25.2	66.0	59.0	Pass
003	011, 019, 027	None	25.9	24.5	66.0	59.0	Pass
004	012, 020, 028	None	27.6	25.2	66.0	59.0	Pass
005	013, 021, 029	R1.0 Bulk Insulation to external wall areas	45.2	26.6	66.0	59.0	Pass
006	014, 022, 030	R1.0 Bulk Insulation to external wall areas	46.9	20.7	66.0	59.0	Pass
007	015, 023,	R1.0 Bulk Insulation	44.9	19.1	66.0	59.0	Pass

<b>Unit No.</b>	<b>Repeated Units</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>Max BASIX Heat Load (MJ/m<sup>2</sup>.yr)</b>	<b>Max BASIX Cool Load (MJ/m<sup>2</sup>.yr)</b>	<b>Pass/Fail</b>
	031	to external wall areas					
008	016, 024, 032	R1.0 Bulk Insulation to external wall areas	46.7	43.0	66.0	59.0	Pass
033		R1.0 Ceiling Insulation (exposed areas only)	29.1	26.3	66.0	59.0	Pass
034		R1.0 Ceiling Insulation (exposed areas only)	28.8	25.1	66.0	59.0	Pass
035		R1.0 Ceiling Insulation (exposed areas only)	29.1	26.3	66.0	59.0	Pass
036		R1.0 Ceiling Insulation (exposed areas only)	28.8	25.1	66.0	59.0	Pass
037		R1.0 Bulk Insulation to external wall areas, R1.0 Ceiling Insulation (exposed areas only)	56.7	28.2	66.0	59.0	Pass
038		R1.0 Bulk Insulation to external wall areas, R1.0 Ceiling Insulation (exposed areas only)	49.3	21.4	66.0	59.0	Pass
039		R1.0 Bulk Insulation to external wall areas, R1.0 Ceiling Insulation (exposed areas only)	51.9	19.8	66.0	59.0	Pass
040		R1.0 Bulk Insulation to external wall areas, R1.0 Ceiling Insulation (exposed areas only)	57.5	47.5	66.0	59.0	Pass
041		Foil Roof Insulation, R2.5 Ceiling Insulation	48.6	26.4	66.0	59.0	Pass
042		Foil Roof Insulation, R2.5 Ceiling Insulation	45.5	25.9	66.0	59.0	Pass
043		R1.0 Bulk Insulation to all External Wall areas, Foil Roof Insulation, R2.5 Ceiling Insulation	60.0	25.4	66.0	59.0	Pass



Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
044		R1.0 Bulk Insulation to all External Wall areas, Foil Roof Insulation, R2.5 Ceiling Insulation	65.7	32.1	66.0	59.0	Pass

**Table 4: BERS Pro Thermal Loads – Building 1A**

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
001	014, 027, 040, 053	None	43.0	14.8	66.0	59.0	Pass
002	015, 028, 041, 054	None	9.2	13.4	66.0	59.0	Pass
003	016, 029, 042, 055	None	41.3	16.9	66.0	59.0	Pass
013	026, 039, 052, 065	None	32.2	24.6	66.0	59.0	Pass
004	017, 030, 043, 056	None	27.9	26.2	66.0	59.0	Pass
012	011, 024, 037, 050, 063, 010, 023, 036, 049, 062, 025, 038, 051, 064	None	51.6	24.0	66.0	59.0	Pass
005	018, 031, 044, 057	None	25.6	21.7	66.0	59.0	Pass
006	019, 032, 045, 058	None	33.3	28.0	66.0	59.0	Pass
007	020, 033, 046	None	28.6	27.4	66.0	59.0	Pass
009	022, 035	None	65.1	36.5	66.0	59.0	Pass
008	021, 034	R1.0 Bulk Insulation to all External Wall areas	49.7	26.8	66.0	59.0	Pass
048		R1.0 Bulk Insulation to all External Wall areas, R1.0 Ceiling Insulation to exposed areas only	50.2	35.4	66.0	59.0	Pass
047		R1.0 Bulk Insulation to all External Wall areas, R1.0 Ceiling Insulation to exposed areas only	52.4	28.0	66.0	59.0	Pass
059		R1.0 Ceiling Insulation to exposed areas only	32.6	28.9	66.0	59.0	Pass
060		R1.5 Ceiling Insulation to exposed areas only,	62.2	40.9	66.0	59.0	Pass

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
		Single Glass Low-E (Total Windows System U-value: 4.7, SHGC:0.63) to all glazing					
061		R1.0 Bulk Insulation to all External Wall areas, R1.5 Ceiling Insulation to exposed areas only, Single Glass Low-E (Total Windows System U-value: 4.7, SHGC:0.63) to all glazing	62.3	29.5	66.0	59.0	Pass
066		Foil Roof Insulation, R2.5 Ceiling Insulation	37.2	18.2	66.0	59.0	Pass
067		Foil Roof Insulation, R2.5 Ceiling Insulation	38.6	20.7	66.0	59.0	Pass
073	072, 071, 070	Foil Roof Insulation, R2.5 Ceiling Insulation	45.0	31.2	66.0	59.0	Pass
068		Foil Roof Insulation, R2.5 Ceiling Insulation	33.7	29.3	66.0	59.0	Pass
069		Foil Roof Insulation, R2.5 Ceiling Insulation	41.4	38.3	66.0	59.0	Pass

**Table 5: BERS Pro Thermal Loads – Building 1B**

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
001		Foil Roof Insulation, R2.5 Ceiling Insulation	65.2	27.9	66.0	59.0	Pass
002		Foil Roof Insulation, R2.5 Ceiling Insulation	24.1	26.0	66.0	59.0	Pass
004		Foil Roof Insulation, R2.5 Ceiling Insulation	30.7	25.7	66.0	59.0	Pass
003		Foil Roof Insulation, R2.5 Ceiling Insulation	34.4	23.6	66.0	59.0	Pass
005		Foil Roof Insulation, R2.5 Ceiling Insulation	47.0	28.3	66.0	59.0	Pass

**Table 6: BERS Pro Thermal Loads – Building 2**

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
001		R0.5 Floor Insulation (adj to open air below), at least 10% ventilation opening to all Bedrooms and Living Area	49.4	33.8	66.0	59.0	Pass

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
		(non-balcony) glazing					
002		R0.5 Floor Insulation (adj to open air below), Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 30% ventilation opening to all East Living & Bedroom glazing	40.3	50.3	66.0	59.0	Pass
009	008	R0.5 Floor Insulation (adj to open air below), at least 20% ventilation opening to all West Bedroom glazing	59.9	42.1	66.0	59.0	Pass
003		R0.5 Floor Insulation (adj to open air below), R1.0 Bulk Insulation to External Walls, Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all East Bedroom glazing only, at least 20% ventilation opening to all Bedroom glazing	63.6	44.6	66.0	59.0	Pass
007		R0.5 Floor Insulation (adj to open air below), at least 10% ventilation opening to Living Room West glazing	61.8	36.6	66.0	59.0	Pass
004		R0.5 Floor Insulation (adj to open air below), R1.0 Bulk Insulation to External Walls, Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 20% ventilation opening to all Bedroom & Study glazing	62.4	54.1	66.0	59.0	Pass
006		R0.5 Floor Insulation (adj to open air below), R1.0 Bulk Insulation to External Walls, at least 10% ventilation opening to all Bedroom & Living Area south glazing	65.0	41.3	66.0	59.0	Pass
005		R0.5 Floor Insulation (adj to open air below), R1.0 Bulk Insulation to External Walls, Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 10% ventilation opening to all Bedroom & Study glazing	63.5	41.8	66.0	59.0	Pass
010	019, 028, 037	At least 10% ventilation opening to all Bedrooms and Living Area (non-balcony) glazing	25.2	38.3	66.0	59.0	Pass
011	020, 029, 038	Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 30% ventilation opening to all East Living & Bedroom glazing	19.7	54.0	66.0	59.0	Pass
018	017, 026,	At least 20% ventilation	24.3	47.8	66.0	59.0	Pass

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
	035, 044, 027, 036, 045	opening to all West Bedroom glazing					
012	021, 030, 039	At least 20% ventilation opening to all Bedroom glazing	35.9	53.4	66.0	59.0	Pass
016	025, 034, 043	At least 10% ventilation opening to Living Room West glazing	32.6	40.3	66.0	59.0	Pass
013	022, 031, 040	Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 20% ventilation opening to Bedroom & Study glazing	36.6	57.7	66.0	59.0	Pass
015	024, 033, 042	At least 10% ventilation opening to all Bedroom & Living Area south glazing	42.4	46.3	66.0	59.0	Pass
014	023, 032, 041	Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 10% ventilation opening to all Bedroom & Study glazing	40.4	44.6	66.0	59.0	Pass
046		R2.5 Ceiling Insulation, at least 10% ventilation opening to all Bedrooms and Living Area (non-balcony) glazing & all Upper floor glazing	49.6	57.7	66.0	59.0	Pass
047		R2.5 Ceiling Insulation, Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 30% ventilation opening to all East Living & Bedroom glazing	17.2	47.8	66.0	59.0	Pass
054	053	R2.5 Ceiling Insulation, At least 20% ventilation opening to all West Bedroom glazing	32.4	53.1	66.0	59.0	Pass
048		R2.5 Ceiling Insulation, At least 20% ventilation opening to all West Bedroom glazing	40.3	52.6	66.0	59.0	Pass
052		R2.5 Ceiling Insulation, at least 10% ventilation opening to Living Room West glazing	39.5	43.8	66.0	59.0	Pass
049		R2.5 Ceiling Insulation, Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 20% ventilation opening to Bedroom & Study glazing	39.9	55.9	66.0	59.0	Pass
051		R2.5 Ceiling Insulation, at least 10% ventilation opening to all Bedroom & Living Area south glazing	49.4	50.3	66.0	59.0	Pass
050		R2.5 Ceiling Insulation, Low-E pyrolytic glass of U-value 4.7 & SHGC 0.63 to all glazing, at least 10% ventilation opening to all Bedroom & Study glazing	45.6	44.7	66.0	59.0	Pass

**Table 7: BERS Pro Thermal Loads – Building 3**

<b>Unit No.</b>	<b>Repeated Units</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>Max BASIX Heat Load (MJ/m<sup>2</sup>.yr)</b>	<b>Max BASIX Cool Load (MJ/m<sup>2</sup>.yr)</b>	<b>Pass/Fail</b>
001	011, 021	At least 10% ventilation opening to all Bedroom glazing	32.3	22.3	66.0	59.0	Pass
002	012, 022	At least 10% ventilation opening to all Bedroom glazing	15.5	14.1	66.0	59.0	Pass
010	020, 030	At least 10% ventilation opening to all Bedroom glazing	53.0	33.5	66.0	59.0	Pass
009	019, 029	At least 10% ventilation opening to all Bedroom glazing	41.5	22.5	66.0	59.0	Pass
003	013, 023	At least 10% ventilation opening to all Bedroom glazing	33.7	23.7	66.0	59.0	Pass
008	018, 028	At least 10% ventilation opening to all Bedroom glazing	62.9	21.4	66.0	59.0	Pass
004	014, 024	At least 10% ventilation opening to all Bedroom glazing	27.5	23.5	66.0	59.0	Pass
007	017, 027	R1.0 Bulk Insulation to External Walls, at least 10% ventilation opening to all Bedroom glazing	38.8	19.4	66.0	59.0	Pass
005	015, 025	At least 10% ventilation opening to all Bedroom glazing	52.6	24.6	66.0	59.0	Pass
006	016, 026	R1.0 Bulk Insulation to External Walls, at least 10% ventilation opening to all Bedroom glazing	50.3	24.1	66.0	59.0	Pass
031		At least 10% ventilation opening to all Bedroom glazing	52.1	36.9	66.0	59.0	Pass
032		At least 10% ventilation opening to all Bedroom glazing	25.1	14.9	66.0	59.0	Pass
040		R2.5 Ceiling Insulation (exposed areas only), at least 10% ventilation opening to Bedroom glazing	58.3	33.7	66.0	59.0	Pass
039		R2.5 Ceiling Insulation (exposed areas only), at least 10% ventilation opening to Bedroom glazing	42.2	23.7	66.0	59.0	Pass
033		At least 10% ventilation opening to all Bedroom glazing	42.6	24.0	66.0	59.0	Pass

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
038		R1.0 Bulk Insulation to External Walls, R2.5 Ceiling Insulation (exposed areas only), at least 10% ventilation opening to South Living glazing	43.8	22.5	66.0	59.0	Pass
034		At least 10% ventilation opening to all Bedroom glazing	38.1	24.5	66.0	59.0	Pass
037		R1.0 Bulk Insulation to External Walls, R2.5 Ceiling Insulation (exposed areas only), at least 10% ventilation opening to Bedroom glazing	39.7	20.3	66.0	59.0	Pass
035		R1.0 Bulk Insulation to External Walls, R2.5 Ceiling Insulation (exposed areas only), at least 10% ventilation opening to Bedroom glazing	48.4	33.2	66.0	59.0	Pass
036		R1.0 Bulk Insulation to External Walls, R2.5 Ceiling Insulation (exposed areas only), at least 10% ventilation opening to Bedroom glazing	54.0	25.8	66.0	59.0	Pass
041		Foil Roof Insulation, R2.5 Ceiling Insulation	34.5	21.2	66.0	59.0	Pass
046		Foil Roof Insulation, R2.5 Ceiling Insulation	64.0	40.3	66.0	59.0	Pass
042		Foil Roof Insulation, R2.5 Ceiling Insulation	35.4	20.1	66.0	59.0	Pass
045		Foil Roof Insulation, R2.5 Ceiling Insulation	65.3	24.8	66.0	59.0	Pass
043		Foil Roof Insulation, R2.5 Ceiling Insulation	41.5	24.5	66.0	59.0	Pass
044		R1.0 Bulk Insulation to External Walls, Foil Roof Insulation, R2.5 Ceiling Insulation	64.1	28.9	66.0	59.0	Pass

**Table 8: BERS Pro Thermal Loads – Building 5**

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
001		None	120.7	0.0	131.0	31.6	0.0
002	003, 006, 007, 008	None	68.5	0.0	88.9	21.8	0.0
004	009	None	73.1	0.0	115.0	21.8	0.0
005		None	60.3	0.0	88.0	14.6	0.0
011		None	59.9	0.0	80.8	13.8	0.0
012		None	58.4	0.0	70.6	24.4	0.0
010		None	82.3	0.0	77.9	47.8	0.0
013		None	118.2	0.0	130.6	39.0	0.0

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
014		None	105.0	0.0	132.4	35.8	0.0
028	027, 024, 023, 022, 021	None	98.9	0.0	138.5	32.8	0.0
026	025	None	95.3	0.0	143.9	26.8	0.0
015	017	None	82.7	0.0	96.5	29.4	0.0
016		None	52.8	0.0	60.1	20.5	0.0
019		None	59.9	0.0	80.8	13.8	0.0
020		None	58.4	0.0	70.6	24.4	0.0
018		None	82.3	0.0	77.9	47.8	0.0
030		None	81.5	0.0	70.0	33.8	0.0
029		None	67.5	5.0	53.9	43.4	0.0

**Table 9: BERS Pro Thermal Loads – Building 6, 6A & 6B**

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
001		R1.0 Bulk Insulation to all External Wall areas, Foil Roof Insulation, R2.5 Ceiling Insulation	44.4	25.7	66.0	59.0	Pass
002	003, 004, 005, 006, 007, 008	Foil Roof Insulation, R2.5 Ceiling Insulation	30.7	25.5	66.0	59.0	Pass
009		R1.0 Bulk Insulation to all External Wall areas, Foil Roof Insulation, R2.5 Ceiling Insulation, at least 20% ventilation opening to East Study glazing	55.1	58.7	66.0	59.0	Pass
6A-001		Foil Roof Insulation, R2.5 Ceiling Insulation	65.7	27.8	66.0	59.0	Pass
6A-002	6B-002, 6B-003	Foil Roof Insulation, R2.5 Ceiling Insulation	31.2	25.5	66.0	59.0	Pass
6A-003	6B-001	Foil Roof Insulation, R2.5 Ceiling Insulation	58.4	29.2	66.0	59.0	Pass
6B-004		Foil Roof Insulation, R2.5 Ceiling Insulation	37.4	31.0	66.0	59.0	Pass

**Table 10: BERS Pro Thermal Loads – Building 7**

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
001	021, 041	None	25.7	35.0	66.0	59.0	Pass
002	022, 042	None	22.7	30.9	66.0	59.0	Pass

<b>Unit No.</b>	<b>Repeated Units</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>Max BASIX Heat Load (MJ/m<sup>2</sup>.yr)</b>	<b>Max BASIX Cool Load (MJ/m<sup>2</sup>.yr)</b>	<b>Pass/Fail</b>
020	040, 060, 080, 017, 037, 057, 077, 016, 036, 056, 076, 013, 033, 053, 073	None	25.2	24.0	66.0	59.0	Pass
003	023, 043, 063, 006, 026, 046, 066, 007, 027, 047, 067, 010, 030, 050, 070	None	20.8	22.3	66.0	59.0	Pass
019	039, 059, 079, 018, 038, 058, 078, 015, 035, 055, 075, 014, 034, 054, 074	None	49.6	25.8	66.0	59.0	Pass
004	024, 044, 064, 005, 025, 045, 065, 008, 028, 048, 068	None	47.3	25.8	66.0	59.0	Pass
009	029, 049, 069	None	28.4	27.7	66.0	59.0	Pass
012	032, 052	None	57.4	24.3	66.0	59.0	Pass
011	031, 051	None	57.7	20.0	66.0	59.0	Pass
061		R1.0 Ceiling Insulation to exposed areas only	29.6	38.4	66.0	59.0	Pass
062		R1.0 Ceiling Insulation to exposed areas only	26.4	32.6	66.0	59.0	Pass
072		R1.0 Ceiling Insulation to exposed areas only	63.3	26.4	66.0	59.0	Pass
071		R1.0 Ceiling Insulation to exposed areas only	62.8	21.0	66.0	59.0	Pass
081		Foil Roof Insulation, R2.5 Ceiling Insulation	45.7	27.2	66.0	59.0	Pass
082		Foil Roof Insulation, R2.5 Ceiling Insulation	43.7	28.0	66.0	59.0	Pass
093		Foil Roof Insulation, R2.5 Ceiling Insulation	46.9	45.7	66.0	59.0	Pass



Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Max BASIX Heat Load (MJ/m <sup>2</sup> .yr)	Max BASIX Cool Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
083	084, 086, 087	Foil Roof Insulation, R2.5 Ceiling Insulation	33.9	26.7	66.0	59.0	Pass
092	091	Foil Roof Insulation, R2.5 Ceiling Insulation	42.8	43.7	66.0	59.0	Pass
085		Foil Roof Insulation, R2.5 Ceiling Insulation	24.4	28.3	66.0	59.0	Pass
089		Foil Roof Insulation, R2.5 Ceiling Insulation	61.6	40.8	66.0	59.0	Pass
090		Foil Roof Insulation, R2.5 Ceiling Insulation	49.8	42.7	66.0	59.0	Pass
088		Foil Roof Insulation, R2.5 Ceiling Insulation	37.8	29.2	66.0	59.0	Pass

#### 4. BASIX ENERGY SECTION

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

The proposed development will meet the mandatory BASIX Energy target of 20% as long as the energy commitments detailed in Table 11 are installed.

**Table 11: Energy Commitments**

Component		Commitment
<b>Common Areas and Central Systems</b>	<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>Alternative Energy Supply</u>	<ul style="list-style-type: none"> <li>Photovoltaic System with rated electrical output of 30.9 peak kW (solar collector areas approximately 230.1 m<sup>2</sup> (approx 177 panels) based on 1 panel of 1.3 m<sup>2</sup> generates 0.175 kW)</li> </ul>
	<u>Pools</u>	<ul style="list-style-type: none"> <li>No pool heating system can be installed for both pools</li> <li>Both pools' pumps must be controlled by timer</li> </ul>
	<u>Ventilation</u>	<ul style="list-style-type: none"> <li>Gym: Air conditioning system, controlled by time clock/BMS</li> <li>Carpark: Ventilation (supply &amp; exhaust) with a CO monoxide monitor &amp; VSD fan</li> <li>Switch Room: Continuous ventilation (exhaust only)</li> <li>Garbage Rooms: Continuous ventilation (exhaust only)</li> <li>Community Room: Air conditioning system, controlled by time clock/BMS</li> <li>Plant/Service Rooms: Continuous ventilation (exhaust only)</li> <li>Ground floor Lobbies: Ventilation Supply Only, controlled by time clock/BMS</li> <li>Other Hallways &amp; lobbies: Ventilation Supply Only, controlled by time clock/BMS</li> </ul>

<b>Component</b>		<b>Commitment</b>
	<u>Lighting</u>	<ul style="list-style-type: none"> <li>Gym: Compact Fluorescent lighting with manual on/off switch</li> <li>Carpark: Fluorescent lighting with zoned switching and motion sensors</li> <li>Lift Cars: Compact Fluorescent lighting, connected to lift call button</li> <li>Switch Room: Compact Fluorescent lighting with manual on/off switch</li> <li>Garbage Rooms: Compact Fluorescent lighting with motion sensors</li> <li>Community Room: Compact Fluorescent lighting with manual on/off switch</li> <li>Plant/Service Room: Compact 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>	Hot Water System	<ul style="list-style-type: none"> <li>Individual Gas Instantaneous HWS 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 &amp; Laundry Exhaust: Individual fan, ducted to roof or façade, interlocked to light</li> </ul>
	<u>Heating &amp; Cooling</u>	<ul style="list-style-type: none"> <li>Heat: Living &amp; Beds to have individual 1-phase air-conditioning 3.5 Stars (new energy rating)<sup>1</sup></li> <li>Cool: Living &amp; Beds to have individual 1 phase air-conditioning 3.5 Star (new energy rating)</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 units' hallways, laundries, bathrooms, kitchens, bedrooms and living areas to use Fluorescent or LED lights with dedicated fittings<sup>2</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 3-star (energy rating) Fridges to Buildings 1, 1B, 5, 6, 6A and 6B ONLY</li> <li>Install 3.5-star (energy rating) Dishwashers and 2-star (energy rating) Dryers to All Residential Buildings</li> <li>Install Indoor or sheltered clothes drying line (eg: screened line on balcony, line over bath, etc) to All Residential Buildings</li> </ul>

## 5. SUMMARY & CONCLUSION

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

The proposed development has also been assessed in terms of its ability to conserve water and minimise energy consumption. With the recommendations contained within this report the proposed development is able to achieve the BASIX requirements and is eligible for BASIX certification. For further details, please refer to the BASIX Certificate No. 425799M\_02, 425840M\_02, 425860M\_02 AND 425857M\_02 provided.

































<sup>1</sup> Changes in energy labelling standards for air conditioners and refrigerators came into effect as of April 1<sup>st</sup> 2010. For more information, please see <http://www.basix.nsw.gov.au/docs/energy/newStarRating.pdf>

<sup>2</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.

## APPENDIX A – ARCHITECTURAL DRAWINGS

The building sustainability performance assessment carried out in this report was based on the following architectural drawings supplied by Rice Daubney Architects received on 26<sup>th</sup> June 2012.

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 Binder1-Residential.pdf	
 SK 217 RETAIL NLA SCHEDULE.PDF	
 SK225 GFA AREA SCHEDULE.PDF	
 DA 01 EXISTING SITE SURVEY PLAN.PDF	
 DA 02 SITE PLAN.PDF	
 DA 03 BASEMENT LEVEL 2 PLAN.PDF	
 DA 04 BASEMENT LEVEL 1 PLAN.PDF	
 DA 05 GROUND FLOOR PLAN.PDF	
 DA 06 LEVEL 1 PLAN.PDF	
 DA 07 LEVEL 2 PLAN.PDF	
 DA 08 LEVEL 3 PLAN.PDF	
 DA 09 LEVEL 4 PLAN.PDF	
 DA 10 LEVEL 5 PLAN.PDF	
 DA 11 LEVEL 6 PLAN.PDF	
 DA 12 LEVEL 7 PLAN.PDF	
 DA 13 LEVEL 8 PLAN.PDF	
 DA 14 ROOF PLAN.PDF	
 DA 15 BUILDING 1 & 1B LAYOUTS.PDF	
 DA 16 BUILDING 1A LAYOUTS.PDF	
 DA 17 BUILDING 2 & 3 LAYOUTS.PDF	
 DA 18 BUILDING 4 & 4A LAYOUTS.PDF	
 DA 19 BUILDING 5 LAYOUTS.PDF	
 DA 20 BUILDING 6 & 6A & 6B LAYOUTS.PDF	
 DA 21 BUILDING 7 LAYOUTS.PDF	
 DA 22 ELEVATIONS - SHEET 1	SOUTH SITE_ NORTH & WEST ELEVATIONS.PDF
 DA 23 ELEVATIONS - SHEET 2	SOUTH SITE_ SOUTH & EAST ELEVATIONS.PDF
 DA 24 ELEVATIONS - SHEET 3	NORTH SITE_ EAST & SOUTH ELEVATIONS.PDF
 DA 25 ELEVATIONS - SHEET 4	NORTH SITE_ NORTH & WEST ELEVATIONS.PDF
 DA 26 SECTIONS.PDF	
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 DA 38 STAGING PLAN.PDF	

## APPENDIX B – AREA SCHEDULES

### Building 1

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001	009, 017, 025	None	61.3	6.8	67.4	27.7	0.0
002	010, 018, 026	None	61.3	6.8	67.4	27.7	0.0
003	011, 019, 027	None	61.3	6.8	67.4	27.7	0.0
004	012, 020, 028	None	61.3	6.8	67.4	27.7	0.0
005	013, 021, 029	None	46.9	8.6	70.7	25.5	0.0
006	014, 022, 030	None	51.4	4.7	70.2	25.5	0.0
007	015, 023, 031	None	61.0	0.0	70.3	23.1	0.0
008	016, 024, 032	None	61.0	0.0	65.7	27.8	0.0
033		None	61.3	6.8	67.4	27.7	0.0
034		None	61.3	6.8	67.4	27.7	0.0
035		None	61.3	6.8	67.4	27.7	0.0
036		None	61.3	6.8	67.4	27.7	0.0
037		None	46.9	8.6	70.7	25.5	0.0
038		None	51.4	4.7	70.2	25.5	0.0
039		None	61.0	0.0	70.3	23.1	0.0
040		None	61.0	0.0	65.7	27.8	0.0
041		None	101.2	0.0	60.2	47.3	0.0
042		None	101.2	0.0	60.2	47.3	0.0
043		None	87.8	0.0	70.4	40.3	0.0
044		None	92.4	0.0	76.8	46.3	0.0

### Building 1A

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001	014, 027, 040, 053	None	71.4	8.5	70.4	30.1	0.0
002	015, 028, 041, 054	None	67.9	0.0	69.1	19.0	0.0
003	016, 029, 042, 055	None	74.3	0.0	64.3	31.6	0.0
013	026, 039, 052, 065	None	67.8	0.0	72.5	22.6	0.0
004	017, 030, 043, 056	None	64.2	0.0	75.0	24.4	0.0

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
012	011, 024, 037, 050, 063, 010, 023, 036, 049, 062, 025, 038, 051, 064	None	76.0	0.0	72.7	26.7	0.0
005	018, 031, 044, 057	None	67.8	0.0	72.5	22.6	0.0
006	019, 032, 045, 058	None	49.0	4.2	71.7	23.4	0.0
007	020, 033, 046	None	84.4	0.0	89.4	33.3	0.0
009	022, 035	None	64.6	5.5	62.6	33.3	0.0
008	021, 034	None	101.9	0.0	85.6	42.3	0.0
048		None	64.6	5.5	62.6	33.3	0.0
047		None	101.9	0.0	85.6	42.3	0.0
059		None	84.4	0.0	89.4	33.3	0.0
060		None	56.1	0.0	50.8	34.6	0.0
061		None	76.9	4.8	79.7	40.5	0.0
066		None	100.0	0.0	75.6	31.7	0.0
067		None	88.0	0.0	73.2	27.9	0.0
073	072, 071, 070	None	67.0	0.0	68.8	18.7	0.0
068		None	120.1	0.0	88.7	37.7	0.0
069		None	130.5	0.0	89.4	35.9	0.0

### Building 1B

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001		None	96.2	0.0	134.9	40.6	0.0
002		None	119.5	0.0	150.4	48.4	0.0
004		None	96.2	0.0	134.9	40.6	0.0
003		None	111.9	0.0	145.9	50.7	0.0
005		None	97.0	0.0	136.4	41.1	0.0

### Building 2

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001		Totally Open	109.8	0.0	87.5	34.3	0.0
002		Totally Open	86.6	0.0	59.4	44.4	0.0
009	008	Totally Open	87.2	0.0	72.7	30.5	0.0
003		Totally Open	43.7	0.0	55.4	25.1	0.0
007		Totally Open	92.9	0.0	91.1	40.7	0.0
004		Totally Open	56.6	0.0	54.5	32.9	0.0
006		Totally Open	76.4	0.0	77.8	30.9	0.0
005		Totally Open	80.0	0.0	63.5	45.6	0.0
010	019, 028, 037	None	109.8	0.0	87.5	34.3	0.0
011	020, 029, 038	None	86.6	0.0	59.4	44.4	0.0
018	017, 026, 035, 044, 027, 036,	None	87.2	0.0	72.7	30.5	0.0

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
	045						
012	021, 030, 039	None	43.7	0.0	55.4	25.1	0.0
016	025, 034, 043	None	92.9	0.0	91.1	40.7	0.0
013	022, 031, 040	None	56.6	0.0	54.5	32.9	0.0
015	024, 033, 042	None	76.4	0.0	77.8	30.9	0.0
014	023, 032, 041	None	80.0	0.0	63.5	45.6	0.0
046		None	152.6	64.0	148.7	83.1	0.0
047		None	86.6	0.0	59.4	44.4	0.0
054	053	None	87.2	0.0	72.7	30.5	0.0
048		None	43.7	0.0	55.4	25.1	0.0
052		None	92.9	0.0	91.1	40.7	0.0
049		None	56.6	0.0	54.5	32.9	0.0
051		None	76.4	0.0	77.8	30.9	0.0
050		None	80.0	0.0	63.5	45.6	0.0

Building 3

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001	011, 021	None	66.5	0.0	69.3	23.8	0.0
002	012, 022	None	61.6	0.0	70.7	20.6	0.0
010	020, 030	None	55.4	0.0	64.9	16.1	0.0
009	019, 029	None	49.8	0.0	77.4	14.4	0.0
003	013, 023	None	68.3	0.0	71.3	23.8	0.0
008	018, 028	None	61.4	0.0	72.2	22.3	0.0
004	014, 024	None	70.9	0.0	75.2	26.4	0.0
007	017, 027	None	62.4	0.0	74.5	21.1	0.0
005	015, 025	None	60.6	0.0	74.7	20.4	0.0
006	016, 026	None	77.7	0.0	75.5	26.6	0.0
031		None	66.5	0.0	69.3	23.8	0.0
032		None	61.6	0.0	70.7	20.6	0.0
040		None	55.4	0.0	64.9	16.1	0.0
039		None	49.8	0.0	77.4	14.4	0.0
033		None	68.3	0.0	71.3	23.8	0.0
038		None	61.4	0.0	72.2	22.3	0.0
034		None	70.9	0.0	75.2	26.4	0.0
037		None	62.4	0.0	74.5	21.1	0.0
035		None	60.6	0.0	74.9	20.2	0.0
036		None	77.7	0.0	75.5	26.6	0.0
041		None	94.7	0.0	72.1	33.2	0.0
046		None	74.2	0.0	65.4	34.0	0.0
042		None	65.7	0.0	65.4	21.2	0.0
045		None	59.7	0.0	67.5	20.0	0.0
043		None	103.0	0.0	92.3	38.4	0.0
044		None	116.0	0.0	63.5	54.0	0.0

### Building 5

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001		None	120.7	0.0	131.0	31.6	0.0
002	003, 006, 007, 008	None	68.5	0.0	88.9	21.8	0.0
004	009	None	73.1	0.0	115.0	21.8	0.0
005		None	60.3	0.0	88.0	14.6	0.0
011		None	59.9	0.0	80.8	13.8	0.0
012		None	58.4	0.0	70.6	24.4	0.0
010		None	82.3	0.0	77.9	47.8	0.0
013		None	118.2	0.0	130.6	39.0	0.0
014		None	105.0	0.0	132.4	35.8	0.0
028	027, 024, 023, 022, 021	None	98.9	0.0	138.5	32.8	0.0
026	025	None	95.3	0.0	143.9	26.8	0.0
015	017	None	82.7	0.0	96.5	29.4	0.0
016		None	52.8	0.0	60.1	20.5	0.0
019		None	59.9	0.0	80.8	13.8	0.0
020		None	58.4	0.0	70.6	24.4	0.0
018		None	82.3	0.0	77.9	47.8	0.0
030		None	81.5	0.0	70.0	33.8	0.0
029		None	67.5	5.0	53.9	43.4	0.0

### Building 6, 6A & 6B

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001		None	96.3	0.0	134.9	40.6	0.0
002	003, 004, 005, 006, 007, 008	None	96.3	0.0	134.9	40.6	0.0
009		None	131.7	0.0	133.2	58.1	0.0
6A-001		None	97.2	0.0	133.3	39.0	0.0
6A-002	6B-002, 6B-003	None	97.2	0.0	133.3	39.0	0.0
6A-003	6B-001	None	97.2	0.0	133.3	39.0	0.0
6B-004		None	128.0	0.0	129.4	58.8	0.0

### Building 7

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
001	021, 041	None	84.3	4.1	80.6	25.3	0.0
002	022, 042	None	84.3	4.1	80.6	25.3	0.0
020	040, 060, 080, 017, 037, 057, 077, 016, 036, 056, 076, 013,	None	60.0	0.0	72.5	22.6	0.0

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
	033, 053, 073						
003	023, 043, 063, 006, 026, 046, 066, 007, 027, 047, 067, 010, 030, 050, 070	None	67.8	0.0	72.5	22.6	0.0
019	039, 059, 079, 018, 038, 058, 078, 015, 035, 055, 075, 014, 034, 054, 074	None	58.0	0.0	74.7	24.7	0.0
004	024, 044, 064, 005, 025, 045, 065, 008, 028, 048, 068	None	76.0	0.0	71.3	28.1	0.0
009	029, 049, 069	None	70.1	0.0	70.0	26.1	0.0
012	032, 052	None	66.9	0.0	70.0	24.7	0.0
011	031, 051	None	82.6	0.0	74.6	30.2	0.0
061		None	84.3	4.1	80.6	25.3	0.0
062		None	84.3	4.1	80.6	25.3	0.0
072		None	66.9	0.0	70.0	24.7	0.0
071		None	82.6	0.0	74.6	30.2	0.0
081		None	91.4	0.0	57.7	44.5	0.0
082		None	91.4	0.0	57.7	44.5	0.0
093		None	67.3	0.0	75.6	26.0	0.0
083	084, 086, 087	None	89.2	0.0	76.8	23.7	0.0
092	091	None	113.7	0.0	85.7	35.4	0.0
085		None	75.3	0.0	71.3	21.1	0.0
089		None	89.3	0.0	61.0	43.7	0.0
090		None	55.2	0.0	73.3	20.1	0.0
088		None	88.8	0.0	68.4	32.0	0.0