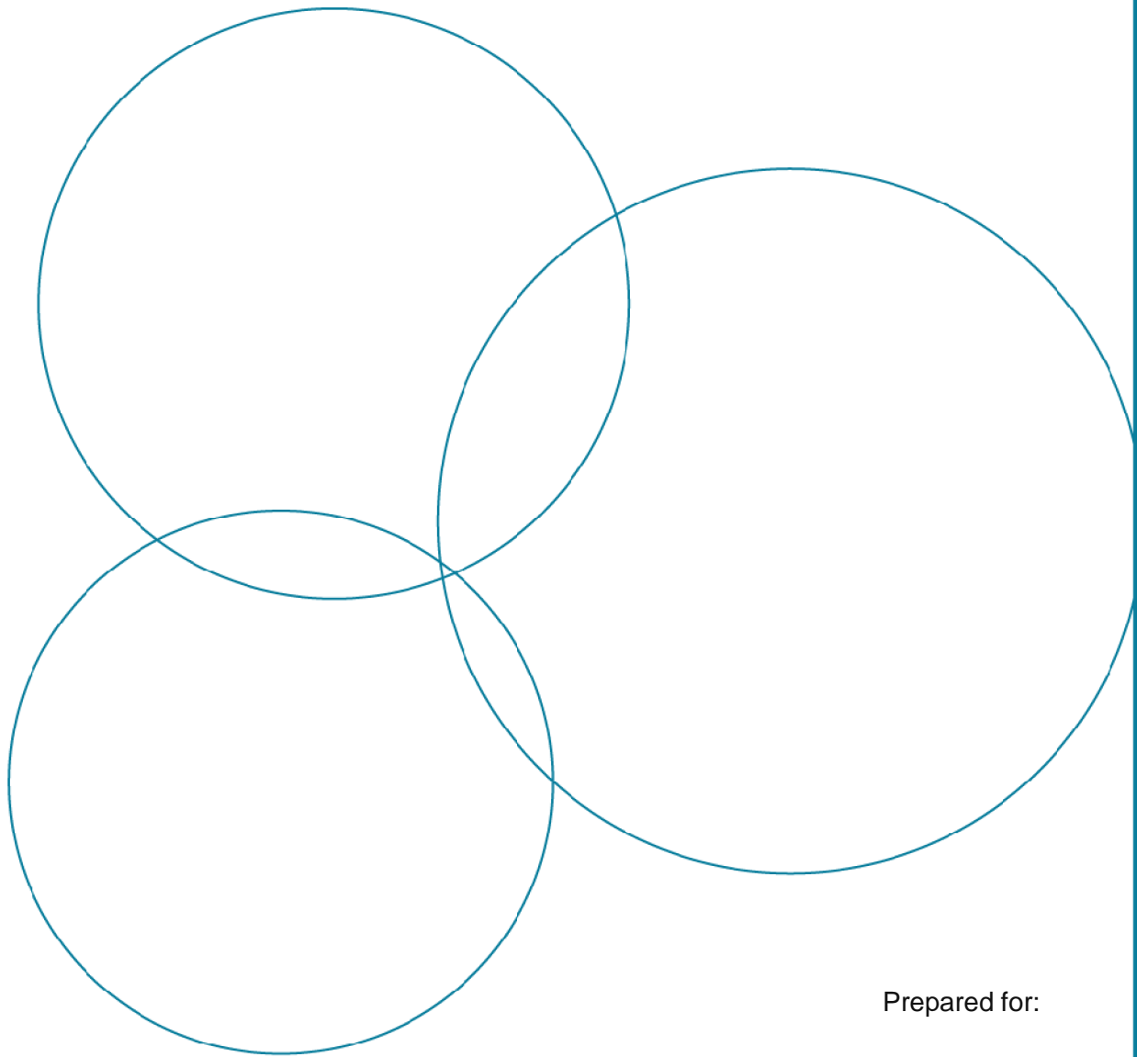


CUNDALL

11/02/2011

ESD Project Application Report

1002779 Discovery Point Stage 1



Prepared for:

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Revision	Description	Date
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<p>This report has been prepared in accordance with the terms and conditions of appointment. Cundall Johnston & Partners Pty Ltd trading as Cundall (ABN 16 104 924 370) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.</p>		
<p>The success and realisation of the proposed initiatives will be dependent upon the commitment of the design team, the development of the initiatives through the life of the design and also the implementation into the operation of the building. Without this undertaking the proposed targets may not be achieved.</p>		

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Executive Summary

This report identifies the sustainability initiatives that are integrated into the design of the proposed Stage 1 development at Discovery Point, Wolli Creek.

The following minimum regulatory requirements for ecologically sustainable development apply to this project:

- Building and Sustainability Index (BASIX) for all residential apartments and associated common areas, stipulating minimum performance in energy, water and thermal comfort;
- SEPP 65 as detailed in the architectural documents;
- BCA 2010 Section J for energy efficiency of the retail component;
- Concept Plan for the Discovery Point area.

Statement of Commitments

The Stage 1 development has been designed in line with the Concept Plan with the majority of apartments having dual orientation, maximising opportunities for natural cross ventilation. The light and ventilation slot provides improved ventilation to apartments, and allows lift lobbies and communal corridors be partially naturally lit. Wherever possible, low-energy lighting operating on motion sensors and energy efficient fixtures will be incorporated into apartments and common areas.

The following BASIX initiatives have been integrated into the design of the apartments:

- Energy conservation strategies
 - Building form and fabric carefully considered to balance solar heat gains, daylight, glare and views to outside. Passive design strategies include external shading, insulation for walls and ceilings, and performance glazing where necessary;
 - An efficient lighting design that will reduce artificial lighting energy consumption and allow maximum advantage to be taken of daylight;
 - Residential units have individual fans but centralised ducting of bathrooms as opposed to a centralised continually operating system therefore reducing energy;
 - Car park ventilation will be fitted with CO monitoring and VSD control to vary fan speeds based on usage;
 - Day/night zoned air conditioning;
 - Energy efficient dishwashers and clothes dryers;
 - All common area lighting and ventilation to be centrally controlled through motion sensors and/or time clocks.
- Water conservation strategies
 - Water efficient fixtures and fittings are used throughout including 3 star WELS shower heads, 4 star WELS toilets, 4 star WELS kitchen taps and 4 star WELS bathroom taps;
 - Connection will be made to the site-wide recycled water for toilet flushing, laundry connections and irrigation of common area landscaping.
- Small car spaces;
- Operable windows and doors with draught sealing;
- Natural ventilation for common areas;
- Recycling facilities and chutes;
- Communal garden, composting strategy at podium;
- Roof garden, edible plants;
- Orientate living areas to the north where possible.

Retail/Gym

- Generally, it is the intention that BCA Section J deemed to satisfy requirements will be complied with for any components not covered by BASIX, such as the retail shops;
- Pool cover on gym pool.

Site

- Variable speed carpark ventilation with CO monitoring and motion sensors for carpark lighting;
- Cool coloured paving broken up with planting;
- Native planting and grass verges;
- Cycle paths;
- Low VOC and low formaldehyde materials;
- Use of recycled materials;
- Acoustic rated materials.

1 Introduction

This report identifies the sustainability initiatives for the Stage 1 development at Discovery Point, Wollie Creek. The development comprises a 14 storey residential tower with ground floor retail and a single storey residential level on a ground floor retail podium as well as community gym, pool and open space facilities on the podium roof top. An interconnected basement provides carparking for the residential and retail components.

1.1 Objectives

The components of the development will be evaluated in response to the following primary ESD issues:

- Reducing greenhouse gas emissions through energy efficiency of building services and building façades;
- Optimising amenity including internal air quality, light and comfort;
- Conserving water;
- Selecting appropriate materials;
- Minimising natural resource consumption, waste, pollution and toxicity during the construction and operation of the development.

It is recognised that the development of ESD solutions will be an integrated approach with the architecture and the building services.

1.2 Minimum Requirements

1.2.1 Building & Sustainability Index (BASIX)

New residential developments in NSW must reduce their energy and water use, according to BASIX requirements developed by the Department of Planning. The objectives of the BASIX scheme are relative to an average development in NSW.

Building 1B (1 storey residential)

- 40% reduction in water consumption;
- 35% reduction in greenhouse gas emissions;
- Minimum thermal performance requirements for heating and cooling loads.

Building 1C (13 storeys residential)

- 40% reduction in water consumption;
- 20% reduction in greenhouse gas emissions;
- Minimum thermal performance requirements for heating and cooling loads.

1.2.2 BCA Section J

The Building Code of Australia 2010 Section J sets minimum energy performance requirements for all new development, which cover air-conditioning, ventilation, lighting, power and hot water, as well as building fabric considerations including thermal construction and insulation, building sealing, glazing and shading. The proposed retail design will be developed to meet the BCA energy efficiency requirements.

2 BASIX Assessment

2.1 BASIX Energy Strategies

Building 1B

Strategies to achieve the BASIX energy target of 35% reduction in energy consumption for Building 1B include the options outlined in the table below.

Facade

- Low e laminate glazing
- Operable louvre shades
- Insulation for thermal comfort
- Natural ventilation where possible



Services

- CFL/LED lighting throughout
- Day/night zoned air conditioning
- Individual kitchen exhausts
- PV panels for common area lighting



Appliances

- Gas cooktops, electric oven
- 4 star dishwashers
- 4 star washing machines
- 2.5 star clothes dryers
- Internal clothesline
- Well ventilated fridge space



Common area

- Centralised gas hot water system
 - Natural ventilation to corridors/lobbies
 - VSD carpark ventilation - with CO monitoring
 - Fluorescent lighting with time clocks and/or motion sensors where appropriate
-



Building 1C

Strategies to achieve the BASIX energy target of 20% reduction in energy consumption for Building 1C include the options outlined in the table below.

Facade

- Low e laminate glazing
- Operable louvre shades
- Insulation for thermal comfort
- Natural ventilation where possible



Services

- CFL/LED lighting in bathrooms, kitchens, laundries and hallways
- Day/night zoned air conditioning
- Individual kitchen exhausts



Appliances

- Gas cooktops, electric oven
- 4 star dishwashers
- 2.5 star clothes dryers



Common area




- Centralised gas hot water system
- Natural ventilation to corridors/lobbies
- VSD carpark ventilation - with CO monitoring
- Fluorescent lighting with time clocks and/or motion sensors where appropriate



For a complete list of BASIX energy commitments, please refer to the BASIX certificate in Appendix A.

2.2 BASIX Water Strategies

Strategies to achieve the BASIX water target of 40% reduction in potable water consumption for Buildings 1B and 1C are outlined in the table below.

Fixtures	
<ul style="list-style-type: none"> • 3 star WELS shower heads, • 4 star WELS kitchen taps, • 4 star WELS bathroom taps • 4 star WELS toilets • Connection to site-wide blackwater recycling system for toilet flushing 	
Appliances	
<ul style="list-style-type: none"> • Connection to site-wide blackwater recycling system for laundry 	
Landscaping	
<ul style="list-style-type: none"> • A proportion of native planting in landscaped areas • Connection to site-wide blackwater recycling system for irrigation 	

With connection to the site-wide blackwater recycling system providing non-potable water for toilet flushing, car washing, laundry and common landscaped area irrigation Buildings 1B and 1C both achieve scores over 50%.

For a complete list of BASIX water commitments, please refer to the BASIX certificate in Appendix A.

2.3 BASIX Thermal Comfort

Thermal comfort for BASIX is assessed using the Building Energy Rating Scheme (BERS). In NSW, the software required to perform thermal assessments is AccuRate.

BASIX requires that each unit achieve a minimum thermal performance. This is calculated using AccuRate which predicts annual heating and cooling loads for a dwelling.

In order to pass BASIX requirements, these loads may not exceed the maximum heating and cooling caps proposed for a certain location. The following objectives must be met:

- Heating and cooling loads for individual dwellings must not exceed the limit specified in the BASIX scheme;
- The average of heating and cooling loads of all the proposed dwellings in a development must not exceed the specified average limit.

Each unit in the proposed development has been assessed to determine heating and cooling load performance. The following thermal performance properties will achieve BASIX requirements. Please see the ABSA certificate in Appendix B for a full list of thermal specifications.

Item	Thermal Performance Requirement
Construction and shading	As indicated on the architectural drawings
Wall insulation	R1.5 to all external walls
Roof insulation	R3 for all exposed roof area
Ceiling insulation	R1 in apartments below all terraces
Floor insulation	None
Glazing	Low e laminate throughout

3 BCA Section J

Retail and any other air conditioned areas not covered by BASIX

3.1 Introduction

In 2006 new energy efficiency requirements for Class 5 to 9 buildings were incorporated into Section J of the Building Code of Australia (BCA) 2006. These define minimum energy efficiency requirements for the performance of building fabric and building services.

The development will comprise of Class 2 residential covered by BASIX as well as Class 6 retail.

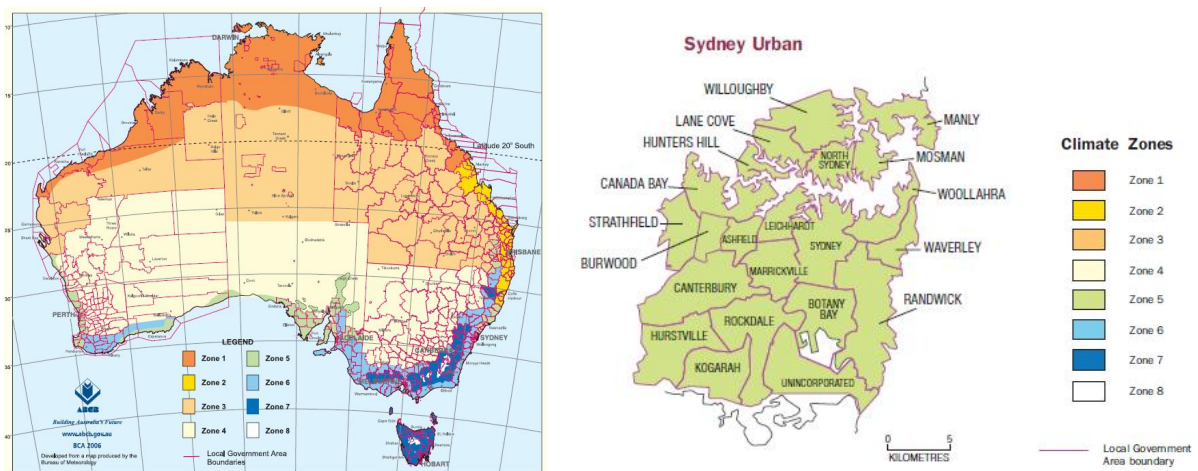
The Deemed-to-Satisfy Provisions in Section J of the BCA 2010 are defined in eight parts:

Part J1 – Building Fabric	Part J5 – HVAC Systems
Part J2 – External Glazing	Part J6 – Artificial Light & Power
Part J3 – Building Sealing	Part J7 – Hot Water Supply
Part J4 – Air Movement	Part J8 – Access for Maintenance

This report discusses considerations for the proposed building fabric against the deemed-to-satisfy provisions in Parts J1 and J2 only. All other parts are considered the responsibility of the respective services consultants and will be developed during construction certificate documentation. Each consultant has taken individual responsibility for compliance with section J BCA but the requirements are summarised below:

3.2 Climate Zones

The BCA has divided Australia into 8 climate zones with varying performance requirements. Woll Creek is in Zone 5.



3.3 General Requirements for J1 and J2

Part J1 regulates minimum thermal construction and performance requirements, including the installation and value of insulation for walls, floors and ceilings. Part J2 regulates glazing in buildings. These requirements are outlined in the following table:

BCA Section	Principle	Requirement
J1.1	Does this section apply?	Yes
J1.2	Thermal construction	Insulation to comply with AS/NZS 4859 and installed to comply with J1.2
J1.3	Roof and ceiling insulation	R3.2 (Downward) R1.6 (Downward) below plantrooms
J1.4	Rooflights	None
J1.5	External walls	R2.8
J1.6	Floors	No insulation required
J2.1	Does this section apply?	Yes
J2.2	Glazing	Glazing performance to comply with deemed to satisfy requirements. This will be provided in construction certificate documentation.

4 Project Application

4.1 Energy conservation

In line with the Concept Plan, the majority of apartments have dual orientation, maximising opportunities for natural cross ventilation. The light and ventilation slot provides improved ventilation to adjacent apartments, and allows lift lobbies and communal corridors to be partially naturally lit. Wherever possible, low-energy lighting operating on motion sensors and energy efficient fixtures will be incorporated into apartments and common areas. A gas bayonet will be provided in the living spaces to give an option of non-electric heating.

4.2 Water conservation

The development proposes a site-wide sewer recycling plant to process blackwater. Non-potable water provided by the system will be used for toilet flushing, in laundries and for irrigation of common area landscaping. Water efficient fixtures will be incorporated into the apartments. A preliminary water balance has revealed that rainwater collection is not required to supplement the blackwater recycling system. The deep soil zone in the Neighbourhood Park enables rainwater and overland flow to enter the ground and replenish the water table. A pool cover will be provided for the gym pool to reduce water loss through evaporation.

4.3 Resource minimisation

The proposed building structures will be constructed predominantly from concrete which has a low embodied energy.

4.4 Green roofs and ecology

A combination of water features, community gardens and lightly planted spaces around the Stage 1 development will offer a variety of spaces where the natural environment may be enjoyed and greater biodiversity encouraged. A podium roof garden with edible plants provides significant visual and physical amenity for residents and reduces heat gain. Composting facilities will also be provided at this podium level.

4.5 Amenity

Many apartments will have a primary aspect that optimises daylight and sunlight access, along with views to the Neighbourhood Park. A majority of the units will have corner or dual aspect to enable natural cross ventilation. Resident amenity is further enhanced by the inclusion of open spaces at ground level which provide recreational and pedestrian spaces within walkable distance. The rooftop terrace above Building 1B will also contribute to the overall level of amenity by offering resident facilities and an injection of vegetation within the built fabric. The development is in close proximity to the train station and retail outlets and a supermarket are included in this stage.

Appendices

Appendix A Certification

A.1 BASIX Certificates

A.2 ABSA Certificates

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 343553M

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 29/06/2009 published by the Department of Planning. This document is available at www.basix.nsw.gov.au

Director-General
Date of issue: Friday, 11 February 2011



Project summary		
Project name	Discovery Point Stage 1C	
Street address	- Brodie Spark Drive Wolli Creek 2205	
Local Government Area	Rockdale City Council	
Plan type and plan number	deposited 1103650	
Lot no.	200	
Section no.	-	
No. of unit buildings	1	
No. of units in unit buildings	121	
No. of attached dwelling houses	0	
No. of separate dwelling houses	0	
Project score		
Water	✓ 56	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 26	Target 20

Certificate Prepared by (please complete before submitting to Council or PCA)

Name / Company Name: Cundall

ABN (if applicable): 16 104 924 370

Description of project

Project address

Project name	Discovery Point Stage 1C
Street address	- Brodie Spark Drive Wolli Creek 2205
Local Government Area	Rockdale City Council
Plan type and plan number	deposited 1103650
Lot no.	200
Section no.	-

Project type

No. of unit buildings	1
No. of units in unit buildings	121
No. of attached dwelling houses	0
No. of separate dwelling houses	0

Site details

Site area (m²)	1000
Roof area (m²)	620
Non-residential floor area (m²)	682
Residential car spaces	94
Non-residential car spaces	133

Common area landscape

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

Assessor details

Assessor number	20888
Certificate number	59622179
Climate zone	56

Project score

Water	✓ 56	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 26	Target 20

Description of project

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

Unit building - Building 1C, 121 dwellings, 14 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
101	1	55.7	1.3	0	0
105	2	76.9	3.1	0	0
109	2	74.6	2.4	0	0
202	1	52.3	2.7	0	0
206	1	59.3	1.7	0	0
210	2	76.9	3.1	0	0
303	1	64.7	2.3	0	0
307	2	66.2	3.8	0	0
311	1	55.6	1.4	0	0
404	1	49.8	3.2	0	0
408	1	48.4	1.6	0	0
501	1	55.7	1.3	0	0
505	2	76.9	3.1	0	0
509	2	77.5	2.4	0	0
602	1	52.3	2.7	0	0
606	1	59.3	1.7	0	0
610	2	76.9	3.1	0	0
703	3	103.1	6.9	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
102	1	52.3	2.7	0	0
106	1	59.3	1.7	0	0
110	2	76.9	3.1	0	0
203	1	64.7	2.3	0	0
207	2	66.2	3.8	0	0
211	1	55.6	1.4	0	0
304	1	49.8	3.2	0	0
308	1	48.4	1.6	0	0
401	1	55.7	1.3	0	0
405	2	76.9	3.1	0	0
409	2	74.6	2.4	0	0
502	1	52.3	2.7	0	0
506	1	59.3	1.7	0	0
510	2	76.9	3.1	0	0
603	1	64.7	2.3	0	0
607	2	66.2	3.8	0	0
611	1	55.6	1.4	0	0
704	1	59.3	1.7	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
103	1	64.7	2.3	0	0
107	2	66.2	3.8	0	0
111	1	55.6	1.4	0	0
204	1	49.8	3.2	0	0
208	1	48.4	1.6	0	0
301	1	55.7	1.3	0	0
305	2	76.9	3.1	0	0
309	2	74.6	2.4	0	0
402	1	52.3	2.7	0	0
406	1	59.3	1.7	0	0
410	2	76.9	3.1	0	0
503	1	64.7	2.3	0	0
507	2	66.2	3.8	0	0
511	1	55.6	1.4	0	0
604	1	49.8	3.2	0	0
608	1	48.4	1.6	0	0
701	2	78.9	2.5	0	0
705	3	66.2	3.8	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
104	1	49.8	3.2	0	0
108	1	48.4	1.6	0	0
201	1	55.7	1.3	0	0
205	2	76.9	3.1	0	0
209	2	74.6	2.4	0	0
302	1	52.3	2.7	0	0
306	1	59.3	1.7	0	0
310	2	76.9	3.1	0	0
403	1	64.7	2.3	0	0
407	2	66.2	3.8	0	0
411	1	55.6	1.4	0	0
504	1	49.8	3.2	0	0
508	1	48.4	1.6	0	0
601	1	55.7	1.3	0	0
605	2	76.9	3.1	0	0
609	2	74.6	2.4	0	0
702	2	86.2	5.8	0	0
706	3	48.4	1.6	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
707	1	77.5	3.9	0	0
802	2	86.2	5.8	0	0
806	1	48.4	1.6	0	0
901	2	78.9	2.5	0	0
905	2	66.2	3.8	0	0
909	2	80.1	3.9	0	0
1004	1	59.3	1.7	0	0
1008	2	76.9	3.1	0	0
1103	2	82.3	3.7	0	0
1107	2	80.1	3.9	0	0
1204	2	84.9	3.1	0	0
1302	3	106.6	4.4	0	0
1306	2	80.1	3.9	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
708	1	76.9	3.1	0	0
803	3	103.1	6.9	0	0
807	2	77.5	3.9	0	0
902	2	86.2	5.8	0	0
906	1	48.4	1.6	0	0
1001	2	78.9	2.5	0	0
1005	2	66.2	3.8	0	0
1009	2	80.1	3.9	0	0
1104	1	59.0	0.0	0	0
1201	3	92.8	7.2	0	0
1205	2	80.7	3.3	0	0
1303	2	81.7	4.3	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
709	2	80.1	3.9	0	0
804	1	59.3	1.7	0	0
808	2	76.9	3.1	0	0
903	3	103.1	6.9	0	0
907	1	77.5	3.9	0	0
1002	2	86.2	5.8	0	0
1006	1	48.4	1.6	0	0
1101	3	118.8	5.2	0	0
1105	2	84.9	3.1	0	0
1202	3	106.6	4.4	0	0
1206	2	80.1	3.9	0	0
1304	2	84.9	3.1	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
801	2	78.9	2.5	0	0
805	2	66.2	3.8	0	0
809	2	80.1	3.9	0	0
904	1	59.3	1.7	0	0
908	2	76.9	3.1	0	0
1003	2	103.1	6.9	0	0
1007	2	77.5	3.9	0	0
1102	3	113.8	6.2	0	0
1106	2	80.7	3.3	0	0
1203	2	81.7	4.3	0	0
1301	3	92.8	7.2	0	0
1305	2	80.7	3.3	0	0

Description of project

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

Common areas of unit building - Building 1C

Common area	Floor area (m ²)
Lift car (No. 1)	-
Switch room (No. 1)	25
Other internal common area (No. 1)	252

Common area	Floor area (m ²)
Lift car (No. 2)	-
Garbage room (No. 1)	15
Ground floor lobby type (No. 1)	74

Common area	Floor area (m ²)
Lift motor room (No. 1)	6
Plant or service room (No. 1)	50
Hallway/lobby type (No. 1)	480

Common areas of the development (non-building specific)

Common area	Floor area (m ²)
Gym (No. 1)	63.7

Common area	Floor area (m ²)
Car park area (No. 1)	4384

Schedule of BASIX commitments

1. Commitments for unit building - Building 1C

(a) Dwellings

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

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for attached dwelling houses

3. Commitments for separate dwelling houses

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

- (i) Water
- (ii) Energy

Schedule of BASIX commitments

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

1. Commitments for unit building - Building 1C

(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 (> 7.5 but <= 9 L/min)	4 star	4 star	4 star	no	-	-	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
All dwellings	on-site recycled water system (no. 1)	See central systems	See central systems	no	yes	yes	no	-
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 into central duct + VSD	interlocked to light	individual fan, ducted to façade or roof	manual switch on/off	central ducted	-

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
All dwellings	3-phase airconditioning EER 3.0 - 3.5 (zoned)	ceiling fans + 3-phase airconditioning EER 3.0 - 3.5 (zoned)	3-phase airconditioning EER 3.0 - 3.5 (zoned)	3-phase airconditioning EER 3.0 - 3.5 (zoned)	0	0	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

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	-	no	4 star	-	2.5 star	no	no

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

(iii) Thermal Comfort	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
(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/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
509	35.6	14
603	23.4	16.2
604	20.3	23.2
709	14.6	8.7
1002	22.3	21.9
1003	15.9	18
1004	14.6	22.3
1005	20.6	15.9
1006	10	26.8
1008	28.6	19.8
1101	10.1	16.2
1102	37.8	14.1
1103	31.6	6.6
1104	45.6	9.1
1105	35.4	15.8

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
1201	6.9	11
1202	27.2	12.1
1203	20.2	8.8
1204	35	14
1301	9	22
1302	16.7	27
1303	34.4	12.1
1304	49.4	20.3
1305	27.6	18.9
1306	27.7	13
1106, 1205	11.9	14.3
702, 802, 902	8.2	17.8
703, 803, 903	2.7	12.4
109, 209, 309, 409	26	16.2
111, 211, 311, 411	5.4	20.1
511, 601, 602, 611	19.7	24.6
701, 801, 901, 1001	9.2	18.9
101, 201, 301, 401, 501	3.8	20.1
102, 202, 302, 402, 502	6.1	17.9
103, 203, 303, 403, 503	3.6	27.2
104, 204, 304, 404, 504	2.8	25
609, 707, 807, 907, 1007	33.5	17.7
809, 909, 1009, 1107, 1206	9.9	8.9
105, 205, 305, 405, 505, 605	1.8	14.8
106, 206, 306, 406, 506, 606, 704, 804, 904	11.4	20.8

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m ² /yr)	Area adjusted cooling load (in mJ/m ² /yr)
107, 207, 307, 407, 507, 607, 705, 805, 905	17.6	14.7
108, 208, 308, 408, 508, 608, 706, 806, 906	8.1	26.4
All other dwellings	13.2	18.9

(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 (> 7.5 but ≤ 9 L/min)	4 star	4 star	no common laundry facility

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

	Common area ventilation system		Common area lighting		
Common area	Ventilation system type	Ventilation efficiency measure	Primary type of artificial lighting	Lighting efficiency measure	Lighting control system/BMS
Lift car (No. 1)	-	-	compact fluorescent	connected to lift call button	No
Lift car (No. 2)	-	-	compact fluorescent	connected to lift call button	No
Lift motor room (No. 1)	ventilation exhaust only	thermostatically controlled	fluorescent	motion sensors	Yes
Switch room (No. 1)	ventilation exhaust only	thermostatically controlled	fluorescent	motion sensors	Yes
Garbage room (No. 1)	ventilation exhaust only	-	fluorescent	motion sensors	Yes
Plant or service room (No. 1)	ventilation supply only	interlocked to light	fluorescent	motion sensors	Yes
Other internal common area (No. 1)	ventilation exhaust only	none ie. continuous	fluorescent	motion sensors	Yes
Ground floor lobby type (No. 1)	ventilation supply only	none ie. continuous	compact fluorescent	motion sensors	Yes
Hallway/lobby type (No. 1)	ventilation exhaust only	none ie. continuous	compact fluorescent	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: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 14
Lift (No. 2)	gearless traction with V V V F motor	Number of levels (including basement): 14

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

(b) Common areas and central systems/facilities

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

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star (> 7.5 but <= 9 L/min)	4 star	4 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central on-site recycled/alternative water supply (No. 1)	To supply at least 10598 litres of recycled water per day to the development (over and above the system's committed capacity, if any)	-	- Irrigation of 0 square metres of common landscape area on the site - car washing in 3 car washing bays on the site
Pool (No. 1)	Volume: 37.1 kLs	Location: Other Pool shaded: yes	-

(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
Gym (No. 1)	air conditioning system	time clock or BMS controlled	fluorescent	time clocks	Yes
Car park area (No. 1)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	fluorescent	motion sensors	Yes

Central energy systems	Type	Specification
Pool (No. 1)	Heating source: gas	Pump controlled by timer: yes

Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

Legend

1. Commitments identified with a "✓" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✓" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✓" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

BASIX[®]Certificate

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

Multi Dwelling

Certificate number: 343532M

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 29/06/2009 published by the Department of Planning. This document is available at www.basix.nsw.gov.au

Director-General

Date of issue: Friday, 11 February 2011



Planning

Project summary

Project name	Discovery Point Stage 1B
Street address	- Brodie Spark Drive Wolli Creek 2205
Local Government Area	Rockdale City Council
Plan type and plan number	deposited 1103650
Lot no.	200
Section no.	-
No. of unit buildings	1
No. of units in unit buildings	9
No. of attached dwelling houses	0
No. of separate dwelling houses	0

Project score

Water	✓ 53	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 35	Target 35

Certificate Prepared by (please complete before submitting to Council or PCA)

Name / Company Name: Cundall

ABN (if applicable): 16 104 924 370

Description of project

Project address

Project name	Discovery Point Stage 1B
Street address	- Brodie Spark Drive Wolli Creek 2205
Local Government Area	Rockdale City Council
Plan type and plan number	deposited 1103650
Lot no.	200
Section no.	-

Project type

No. of unit buildings	1
No. of units in unit buildings	9
No. of attached dwelling houses	0
No. of separate dwelling houses	0

Site details

Site area (m²)	2200
Roof area (m²)	2200
Non-residential floor area (m²)	2406
Residential car spaces	10
Non-residential car spaces	68

Common area landscape

Common area lawn (m²)	200
Common area garden (m²)	40
Area of indigenous or low water use species (m²)	40

Assessor details

Assessor number	20888
Certificate number	84563830
Climate zone	56

Project score

Water	✓ 53	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 35	Target 35

Description of project

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

Unit building - Building 1B, 9 dwellings, 2 storeys above ground

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
1	2	89.3	0.7	0	0
5	2	89.3	0.0	0	0
9	2	78.9	0.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
2	2	89.3	0.7	0	0
6	1	52.5	0.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
3	1	77.5	4.5	0	0
7	1	52.5	0.0	0	0

Dwelling no.	No. of bedrooms	Conditioned floor area (m ²)	Unconditioned floor area (m ²)	Area of garden & lawn (m ²)	Indigenous species (min area m ²)
4	2	108.6	0.0	0	0
8	1	52.5	0.0	0	0

Description of project

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

Common areas of unit building - Building 1B

Common area	Floor area (m ²)
Gym (No. 1)	4.4
Lift motor room (No. 1)	6
Plant or service room (No. 1)	50
Hallway/lobby type (No. 2)	35

Common area	Floor area (m ²)
Car park area (No. 1)	2660
Switch room (No. 1)	25
Ground floor lobby type (No. 1)	30

Common area	Floor area (m ²)
Lift car (No. 1)	-
Garbage room (No. 1)	15
Hallway/lobby type (No. 1)	40

Schedule of BASIX commitments

1. Commitments for unit building - Building 1B

(a) Dwellings

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

(b) Common areas and central systems/facilities

- (i) Water
- (ii) Energy

2. Commitments for attached dwelling houses

3. Commitments for separate dwelling houses

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

- (i) Water
- (ii) Energy

Schedule of BASIX commitments

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

1. Commitments for unit building - Building 1B

(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 (> 7.5 but <= 9 L/min)	4 star	4 star	4 star	no	-	-	-	-	-	-	-	-	-

	Alternative water source							
Dwelling no.	Alternative water supply systems	Size	Configuration	Landscape connection	Toilet connection (s)	Laundry connection	Pool top-up	Spa top-up
All dwellings	on-site recycled water system (no. 1)	See central systems	See central systems	-	yes	yes	-	-
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, not ducted	manual switch on/off	central ducted	-

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
1	3-phase airconditioning EER 3.0 - 3.5 (zoned)	3-phase airconditioning EER 3.0 - 3.5 (zoned)	3-phase airconditioning EER 3.0 - 3.5 (zoned)	3-phase airconditioning EER 3.0 - 3.5 (zoned)	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
2, 3, 4	3-phase airconditioning EER 3.5 - 4.0 (zoned)	3-phase airconditioning EER 3.5 - 4.0 (zoned)	3-phase airconditioning EER 3.5 - 4.0 (zoned)	3-phase airconditioning EER 3.5 - 4.0 (zoned)	2 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no
5, 6, 7, 8, 9	3-phase airconditioning EER 3.5 - 4.0 (zoned)	3-phase airconditioning EER 3.5 - 4.0 (zoned)	3-phase airconditioning EER 3.5 - 4.0 (zoned)	3-phase airconditioning EER 3.5 - 4.0 (zoned)	1 (dedicated)	1 (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	yes (dedicated)	0	no

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	4 star	4 star	4.5 star	yes	no

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

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

	Thermal loads	
Dwelling no.	Area adjusted heating load (in mJ/m²/yr)	Area adjusted cooling load (in mJ/m²/yr)
1	27.4	15.6
2	31.3	19.7
3	30.2	34.4
4	14.3	35.7
5	5.3	12.1
9	5.3	29.1
All other dwellings	13.9	18.4

(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 (> 7.5 but ≤ 9 L/min)	4 star	4 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Pool (No. 1)	Volume: 2.6 kLs	Location: Building 1B Pool shaded: yes	-

(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.		✓	✓

(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
Gym (No. 1)	air conditioning system	time clock or BMS controlled	fluorescent	time clocks	Yes
Car park area (No. 1)	ventilation (supply + exhaust)	carbon monoxide monitor + VSD fan	fluorescent	motion sensors	Yes
Lift car (No. 1)	-	-	compact fluorescent	connected to lift call button	No
Lift motor room (No. 1)	ventilation exhaust only	thermostatically controlled	fluorescent	manual on / manual off	Yes
Switch room (No. 1)	ventilation exhaust only	thermostatically controlled	fluorescent	manual on / manual off	Yes
Garbage room (No. 1)	ventilation exhaust only	-	fluorescent	motion sensors	Yes
Plant or service room (No. 1)	ventilation supply only	interlocked to light	fluorescent	motion sensors	Yes
Ground floor lobby type (No. 1)	no mechanical ventilation	-	compact fluorescent	motion sensors	Yes
Hallway/lobby type (No. 1)	ventilation supply only	none ie. continuous	compact fluorescent	motion sensors	Yes
Hallway/lobby type (No. 2)	ventilation supply only	none ie. continuous	compact fluorescent	motion sensors	Yes

Central energy systems	Type	Specification
Central hot water system (No. 1)	gas instantaneous	Solar collector area (minimum, in square metres): 0 Piping insulation (ringmain & supply risers): (a) Piping external to building: R1.0 (~38 mm); (b) Piping internal to building: R1.0 (~38 mm)

Central energy systems	Type	Specification
Lift (No. 1)	gearless traction with V V V F motor	Number of levels (including basement): 4
Pool (No. 1)	Heating source: gas	Pump controlled by timer: yes

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

(b) Common areas and central systems/facilities

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

Common area	Showerheads rating	Toilets rating	Taps rating	Clothes washers rating
All common areas	3 star (> 7.5 but <= 9 L/min)	4 star	4 star	no common laundry facility

Central systems	Size	Configuration	Connection (to allow for...)
Central on-site recycled/alternative water supply (No. 1)	To supply at least 737 litres of recycled water per day to the development (over and above the system's committed capacity, if any)	-	- Irrigation of 200 square metres of common landscape area on the site - car washing in 1 car washing bays on the site

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

Central energy systems	Type	Specification
Alternative energy supply	Photovoltaic system	Rated electrical output (min): 4.5 peak kW

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).

Assessor Certificate

Multiple Dwellings

Certificate Version 6.1. Prior versions not valid after 1 March 2006

Issued in accordance with
BASIX Thermal Comfort Simulation Method.



Assessor			
Name:	Joel Clayton	Company:	Cundall
Address:	Level 7, 657 Pacific Highway, St Leonards, NSW, 2065		
Phone:	02 8424 7000	Fax:	Email:
Declaration of interest: The Assessor has provided design advice to the Applicant			
Client			
Name:	Christopher Pope	Company:	Australand
Address:	Locked Bag 2106, North Ryde NSW 1670		
Phone:	0297672235	Fax:	Email:
Project			
Address:	Brodie Sparks Drive, Wolli Creek, NSW 2205 (Stage 1C)		
Applicant:	Christopher Pope	LGA:	Rockdale City Council
Assessment			
Date:	08/02/2011	File ref:	Software: Accurate
			Version: 1.1.4.1
Documentation			

All details, upon which this assessment has been based, are included in the project documentation that has been stamped and signed by the Assessor issuing this certificate, as identified below:

Thermal Performance Spec:

Attached, Affixed to drawings Page#: DA2.101

Drawings: (Title, Ref.#, Revision, Issue date, etc)

DA1.001 to 002, DA1.101, DA2.101 to 104, DA2.200 to 205, DA3.100 to 101, DA8.001 to 004, DA8.101

Building Specifications: (Title, Ref.#, Revision, Issue date, etc)



ABSA Assessor Certificate		Assessor # 20888		Certificate # 59622179		Issued: 08/02/2011	
Thermal performance specifications						Page 1 of 1	
Unit number(s)	Certificate number	Floor area (M ²)		Predict. loads (MJ/M ² /y)		Concessions	Qualify for ventilation bonus
		Cond.	Uncond.	Heat	Cool (Sens & Lat)		
101, 201, 301, 401, 501, 601	59622179	55.7	1.3	3.8	20.1		
102, 202, 302, 402, 502	31005634	52.3	2.7	6.1	17.9		
103, 203, 303, 403, 503, 603	54367616	64.7	2.3	3.6	27.2		
104, 204, 304, 404, 504	34301592	49.8	3.2	2.8	25.0		
105, 205, 305, 405, 605	45004863	76.9	3.1	1.8	14.8		
106, 106, 306, 406, 506, 606, 704, 804, 904	25541538	59.3	1.7	11.4	20.8		
107, 207, 307, 407, 507, 607, 705, 805, 905	44261629	66.2	3.8	17.6	14.7		

108, 208, 308, 408, 508, 608, 706, 806, 906	78596726	48.4	1.6	8.1	26.4		
109, 209, 309, 409	44930288	74.6	2.4	26	16.2		
110, 210, 310, 410, 510, 610, 708, 808, 908, 1008	12861345	76.9	3.1	13.2	18.9		
111, 211, 311, 411, 511	43783118	55.6	1.4	5.4	20.1		
509	85672851	77.5	2.5	36.0	17.7		
602	26544711	52.3	2.7	6.6	16.8		
604	36103820	49.8	3.2	2.4	27.5		
609	54114621	77.5	2.5	33.5	17.7		
611	84332427	55.6	1.4	8.2	21.9		
701, 801, 901, 1001	50183959	77.5	2.5	33.5	17.7		
702, 802, 902	65243669	86.2	5.8	8.2	17.8		
703, 803, 903	41315840	103.1	6.9	2.7	12.4		
707, 807, 907,1007	49329532	80.1	3.9	33.8	16.3		
709	37166879	80.1	3.9	14.6	8.7		
809, 909, 1009, 1107, 1206	86148558	80.1	3.9	9.9	8.9		
1002	31744750	86.2	5.8	22.3	21.9		
1003	23531706	103.1	6.9	15.9	18		
1004	24133721	59.3	1.7	14.6	22.3		
1005	62804589	66.2	3.8	20.6	15.9		
1006	62299844	48.4	1.6	10.0	26.8		
1101	80861136	118.8	5.2	10.1	16.2		
1102	25313194	113.8	6.2	37.8	14.1		
1103	18188769	82.3	3.7	31.6	6.6		
1104	37234521	59.01	0	45.6	9.1		
1105, 1204	80398146	84.9	3.1	35.4	15.8		
1106, 1205	81513203	80.7	3.3	11.9	14.3		
1201	84664402	92.8	7.2	6.9	11.0		
1202	71777294	106.6	4.4	27.2	12.1		
1203	24031646	81.7	4.3	20.2	8.8		
1301	55469802	92.8	7.2	9.0	22.0		
1302	57147888	106.6	4.4	16.7	27.0		
1303	58334639	81.7	4.3	34.4	12.1		
1304	21819724	84.9	3.1	49.4	20.3		
1305	68314826	80.7	3.3	27.6	18.9		
1306	72785265	80.1	3.9	27.7	13.0		

Assessor # 20888

Certificate # 59622179

Issued: 08/02/2011

Thermal Performance Specifications

These are the Specifications upon which the Certified Assessment is based. If details included in these Specifications vary from other drawings or written specifications, these Specifications shall take precedence. If only one specification option is detailed for a building element, that specification must apply to all instances of that element for the project. If alternate specifications are detailed for a building element, the location and extent of alternate specifications must be detailed below and / or clearly indicated on referenced documents

Windows	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
38 ComfortPlus Neutral		Single	Aluminium	4.13	0.61		

Skylights	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
nil							

Window and skylight U and SHGC values, if specified, are according to ANAC 2005. Alternate products or specifications may be used if their U value is lower, and the SHGC value is less than 10% higher or lower, than the U and SHGC values of the product specified above.

External walls	Construction	Insulation	Colour – solar abs.	Detail
Concrete		R1.5	Medium	

Internal walls	Construction	Insulation	Detail
Double Plasterboard		Nil	As per detail on plans
Concrete Party Wall		Nil	As per detail on plans

Floors	Construction	Insulation	Covering	Detail
Concrete		Nil	Carpet	As per detail on plans
Concrete		Nil	Ceramic Tile	As per detail on plans

Ceilings	Construction	Insulation	Detail
Concrete		Nil	Between Apartments
Concrete		R1.0	Terraces / Balconies above

Roof	Construction	Insulation	Colour – solar abs.	Detail
Concrete		R3.0	medium	

Window cover	Internal (curtains)	External (awnings, shutters, etc)
-		as per detail on plans

Fixed shading	Eaves (width - inc. gutters, h't above windows)	Verandahs, Pergolas (type, description)
-		Balcony as per detail on plans

Overshadowing	Overshadowing structures	Overshadowing trees

Orientation, Exposure, Ventilation and Infiltration

Orientation of nominal north:	350
Terrain category:	Suburb
Roof ventilation:	Unventilated
Cross ventilation:	None
Subfloor:	On Ground
Living area open to entry:	Yes
Doors separate living areas:	No
Stair open to heated areas:	No
Seals to windows and doors:	Yes
Exhaust fans without dampers:	No
Ventilated skylights:	No
Open fire, unflued gas heat:	No
Vented downlights:	No
Wall and ceiling vents:	No

ABSA Assessor stamp



Assessor Certificate

Multiple Dwellings

Certificate Version 6.1. Prior versions not valid after 1 March 2006

Issued in accordance with
BASIX Thermal Comfort Simulation Method.



Assessor							
Name:	Joel Clayton	Company:	Cundall	ABSA #:	20888		
Address:	Level 7, 657 Pacific Highway, St Leonards, NSW, 2065						
Phone:	02 8424 7000	Fax:		Email:			
Declaration of interest: The Assessor has provided design advice to the Applicant							
Client							
Name:	Christopher Pope	Company:	Australand				
Address:	Locked Bag 2106, North Ryde NSW 1670						
Phone:	0297672235	Fax:		Email:			
Project							
Address:	Brodie Sparks Drive, Wolli Creek, NSW 2205 (Stage 1B)						
Applicant:	Christopher Pope	LGA:	Rockdale City Council				
Assessment							
Date:	08/02/2011	File ref:	Stage 1B	Software:	Accurate	Version:	1.1.4.1
Documentation							

All details, upon which this assessment has been based, are included in the project documentation that has been stamped and signed by the Assessor issuing this certificate, as identified below:

Thermal Performance Spec:

Attached, Affixed to drawings Page#: DA2.201

Drawings: (Title, Ref.#, Revision, Issue date, etc)

DA2.200 to .202, DA1.001, DA8.002 to .004

Building Specifications: (Title, Ref.#, Revision, Issue date, etc)



ABSA Assessor Certificate		Assessor # 20888		Certificate # 84563830		Issued: 08/02/2011	
Thermal performance specifications						Page 1 of 1	
Unit number(s)	Certificate number	Floor area (M ²)		Predict. loads (MJ/M ² /y)		Concessions	Qualify for ventilation bonus
		Cond.	Uncond.	Heat	Cool (Sens & Lat)		
101	84563830	89.3	0.7	27.4	15.6		
102	65272127	89.3	0.7	31.3	19.7		
103	73859760	77.5	4.5	30.2	34.4		
104	36313589	108.6	0	14.3	35.7		
105	53103755	89.3	0	5.3	12.1		
106, 107, 108	39630306	52.5	0	13.9	18.4		
109	25581476	78.9	0	5.3	29.1		

Assessor # 20888

Certificate # 84563830

Issued: 08/02/2011

Thermal Performance Specifications

These are the Specifications upon which the Certified Assessment is based. If details included in these Specifications vary from other drawings or written specifications, these Specifications shall take precedence. If only one specification option is detailed for a building element, that specification must apply to all instances of that element for the project. If alternate specifications are detailed for a building element, the location and extent of alternate specifications must be detailed below and / or clearly indicated on referenced documents

Windows	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
38 ComfortPlus Neutral		Single	Aluminium	4.13	0.61		

Skylights	Product ID	Glass	Frame	U value	SHGC	Area M ²	Detail
nil							

Window and skylight U and SHGC values, if specified, are according to ANAC 2005. Alternate products or specifications may be used if their U value is lower, and the SHGC value is less than 10% higher or lower, than the U and SHGC values of the product specified above.

External walls	Construction	Insulation	Colour – solar abs.	Detail
Concrete		R1.5	Medium	

Internal walls	Construction	Insulation	Detail
Double Plasterboard		Nil	As per detail on plans
Concrete Party Wall		Nil	As per detail on plans

Floors	Construction	Insulation	Covering	Detail
Concrete		Nil	Carpet	As per detail on plans
Concrete		Nil	Ceramic Tile	As per detail on plans

Ceilings	Construction	Insulation	Detail
Concrete		Nil	Between Apartments
Concrete		R1.0	Terraces / Balconies above

Roof	Construction	Insulation	Colour – solar abs.	Detail
Concrete		R3.0	medium	

Window cover	Internal (curtains)	External (awnings, shutters, etc)
-		as per detail on plans

Fixed shading	Eaves (width - inc. gutters, h't above windows)	Verandahs, Pergolas (type, description)
-		Balcony as per detail on plans

Overshadowing	Overshadowing structures	Overshadowing trees

Orientation, Exposure, Ventilation and Infiltration

Orientation of nominal north:	350
Terrain category:	Suburb
Roof ventilation:	Unventilated
Cross ventilation:	None
Subfloor:	On Ground
Living area open to entry:	Yes
Doors separate living areas:	No
Stair open to heated areas:	No
Seals to windows and doors:	Yes
Exhaust fans without dampers:	No
Ventilated skylights:	No
Open fire, unflued gas heat:	No
Vented downlights:	No
Wall and ceiling vents:	No

ABSA Assessor stamp

