



Tzannes

BASIX ASSESSMENT REPORT

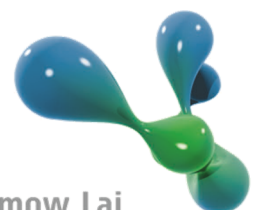
PALM BEACH RESIDENCE

346-352 WHALE BEACH ROAD

Palm Beach, NSW 2108

Report No: S.TZA-0105-R01

Report Date: 04/03/2019



Umwow Lai

engineering sustainable environments

REPORT AUTHORISATION

PROJECT: Palm Beach Residence
346-352 Whale Beach Road
Palm Beach, NSW 2108

Date	Rev	Comment	Prepared by	Checked by	Authorised by
04/03/19	0	Issue for DA submission	DAA	PJ	PJ

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1.0 INTRODUCTION

1.1 SCOPE

This report will provide an assessment of compliance with the Building Sustainability Index (BASIX) for the proposed Palm Beach Residence located at 346-352 Whale Beach Road, Palm Beach, NSW, 2108.

BASIX applies to all residential dwelling types (Class 1, 2 and Part 4) and is an integral part of the development application process in NSW, implemented under the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) and State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004 (the BASIX SEPP).

The BASIX assessment tool analyses data relating to the design of proposed dwelling(s), assesses the anticipated water consumption and greenhouse gas emissions levels and determines how this scores against water and energy targets. The expected thermal performance of the proposed building is also assessed as part of BASIX. For the water and energy targets, the development is assessed on how it is likely to perform against existing dwellings of the same type. All three categories (water, thermal comfort and energy) must meet specific targets before the proposed development can be issued with a BASIX certificate.

This report will provide details on how each category has achieve its prescribes targets, resulting in a compliant BASIX certificate, for the proposed Palm Beach Residence.



1.2 SOURCE DOCUMENTATION

Table 1 outlines a summary of the documentation used as the basis of this compliance analysis.

<i>Discipline</i>	<i>Drawing Title</i>	<i>Drawing No.</i>	<i>Revision</i>	<i>Custodian</i>
Architectural	Site Plan Existing & Demolition	0101	C	Tzannes
Architectural	Site Plan Proposed	0102	C	Tzannes
Architectural	Basement Floor Plan	1100	C	Tzannes
Architectural	Basement Plant Floor Plan	1101	C	Tzannes
Architectural	Ground Floor Plan	1102	C	Tzannes
Architectural	Level 1 Plan	1103	C	Tzannes
Architectural	Level 2 Plan	1104	C	Tzannes
Architectural	Roof Plan	1105	C	Tzannes
Architectural	Elevations Sheet 1	2000	B	Tzannes
Architectural	Elevations Sheet 2	2001	B	Tzannes
Architectural	Sections Sheet 1	3000	B	Tzannes
Architectural	Sections Sheet 2	3001	B	Tzannes
Architectural	Sections Sheet 3	3002	B	Tzannes
Architectural	Sections Sheet 4	3003	B	Tzannes
Architectural	Sections Sheet 5	3004	B	Tzannes

Table 1 Summary of basis documentation

1.3 LIMITATIONS OF THIS REPORT

Due care and skill has been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Umow Lai for detailed advice which will take into account that party's particular requirements.

It is the responsibility of each member of the design team to inform of any services, structural or architectural changes that may affect the performance of the thermal envelope of the proposed design. Umow Lai should be informed immediately of any deviation from the thermal performances contained herein, so that this report may be updated to accurately reflect these changes. Umow Lai cannot be held responsible for document validity claims made as a result of design changes undertaken without its knowledge



2.0 WATER

The Water section of BASIX aims to reduce the potable water consumption of all new residential developments. The benchmark is 90,340 litres of water per person per year (or 247 litres per person per day), which was the average potable water consumption of a pre-BASIX home.

The water reduction target ranges from 40% to 0% depending on the climatic zone. A target reduction of **≥40%** is required for this project. The 40% reduction target applies to 90% of new residential development and 98% of high-growth areas. The BASIX targets are determined from data provided by state and federal energy and water utilities, as well as long-term climate data from the Bureau of Meteorology.

Below, Table 2 illustrates the BASIX water specification.

Water commitments		
Garden and Lawn	Total area of Garden and Lawn to be maintained $\leq 120\text{m}^2$ No indigenous or low water use species specified	
Fixtures	Showerheads	3 star (>7.5 but $\leq 9\text{L/min}$)
	Toilets	4 star
	Kitchen taps	4 star
	Bathroom vanity taps	4 star
Alternative water	Minimum 6500L Rainwater tank to be installed	
	Harvested Roof Area	Minimum 150 m^2
	Connected to	All toilets At least one outdoor tap A tap located within 10m of the swimming pool
Swimming Pool	The swimming pool must not have a volume greater than 50 kilolitres The swimming pool must have a cover	

Table 2 Water specification



3.0 THERMAL COMFORT

A detailed assessment utilising National House Energy Rating Scheme (NatHERS) accredited software has been undertaken in order to verify compliance with the BASIX Thermal Comfort requirements. Compliance with the BASIX thermal comfort section aims to:

- Ensure thermal comfort for a dwelling's occupants, appropriate to the climate and season;
- Reduce greenhouse gas emissions from artificial cooling and heating; and
- Manage peak demand for energy required for cooling and heating, thereby reducing the need for new or upgraded energy infrastructure

Under the simulation method BASIX assigns the maximum allowable heating and cooling loads to a dwelling according to the NatHERS climate regions, based on postcode. Should the modelling demonstrate both heating and cooling loads (or thermal loads) fall below the maximum allowable, the dwelling(s) is deemed to be compliant. The thermal loads are calculated as the amount of energy that would be required to maintain the temperature within an acceptable range and take into account the following.

- The dwelling's construction and insulation; including floors, walls, ceilings and roof; and
- The dwelling's glazing and skylights; based on size, performance, shading and overshadowing.

Please refer to Table 3 & 4 below for the thermal comfort modelling results and applicable building specification which determined these results. Please note that any departures from this specification may require an update to the modelling

Predicted annual energy load: 61.2MJ/m²		Star rating: 5.3
Thermal performance loads	Heating	37.6 MJ/m²
	Cooling	23.6 MJ/m²
Net floor area	Conditioned	529.2 m²
	Unconditioned	10.6 m²
NatHERS certificate number	4LHR25UG7R	
NatHERS accredited software package	FirstRate5: 5.2.9 (3.13)	
Climate zone	56	

Table 3 Thermal comfort results



Thermal Comfort Specification	
External wall construction	Solid concrete with minimum R1.2 insulation (insulation value only) to lift
	Masonry cavity construction with minimum R1.9 insulation (insulation value only) to all other walls
External wall colour	Default external wall colour modelled
Internal wall construction	Solid concrete with minimum R1.2 insulation (insulation value only) to lift
	Single skin masonry to all internal walls
Roof construction	Metal deck roof over stair/void connecting south bedroom wing to main living areas on Level 1 with minimum R4.0 insulation (insulation value only).
	Metal deck roof with plasterboard ceiling to "pop up" sections over Level 2 as shown on Roof Plan with minimum R4.0 insulation (insulation value only).
	Concrete roof with plasterboard ceiling to all other areas with R4.0 insulation (insulation value only).
Roof colour	Medium roof colour throughout $0.4 < S.A < 0.6$.
Floor construction	Concrete slab on ground with minimum R1.0 insulation (insulation value only)
	Suspended concrete slab between all levels: <ul style="list-style-type: none"> Where slab is exposed to outside air beneath a minimum R2.0 insulation (insulation value only) required Where slab is over "void zone" on Ground Floor a minimum R2.0 insulation (insulation value only) required
Floor coverings	Default floor coverings to bedrooms (i.e. any floor covering permissible). Tiles to all other areas
In-slab heating or cooling	Where there is an in-slab heating or cooling system, the applicant must install insulation with an R-Value of not less than 1.0 around the vertical edges of the perimeter of the slab, and underneath the slab if it is a suspended floor.
Ceiling penetrations	No downlights are proposed. All exhausts are to be sealed.
Glazing specification	South wing bedroom windows on Ground Floor and Level 1 to be low-e single glazed in aluminium frames ≥ 4.80 and a SHGC of 0.59 $\pm 10\%$. <i>Refer to Appendix C for mark-up illustrating applicable locations</i>
	All other glazing to be low-e double glazed in high performance frames with a U-Value of 2.33 and a SHGC of 0.50 .
External shading	Retractable external louvre shading provided as per plans and elevations

Table 4 Thermal comfort specification



4.0 ENERGY

The Energy section of BASIX aims to reduce the greenhouse gas (GHG) emissions of all new residential dwellings. The benchmark is 3,292 kilograms of carbon dioxide per person per year, which was the average for pre-BASIX homes.

To achieve the reduction in GHG emissions, BASIX sets Energy targets, which vary depending on the type and location of home you are building. The Energy target for this project is a $\geq 50\%$ reduction.

All of the following contribute to a BASIX energy score: hot water system, heating and cooling, ventilation and exhaust, lighting, pools and spas, alternative energy sources and other energy uses. In addition, the loads (or results) from Thermal Comfort are combined with the selected heating and cooling appliances in the Energy section to calculate the cooling and heating component of your Energy score.

Below, Table 5 illustrates the BASIX energy specification.

Energy commitments		
Hot water	Gas storage ≥ 5 stars	
Cooling system	Living area(s)	3-phase air conditioning: EER 3.0 – 3.5 or greater
	Bedroom(s)	
Heating system	Living area(s)	3-phase air conditioning: EER 3.0 – 3.5 or greater
	Bedroom(s)	
Mechanical ventilation	At least bathrooms	Individual fan, ducted to façade or roof Manual switch on / timer off
	Kitchen	Individual fan, ducted to façade or roof Manual switch on / off
	Laundry	Individual fan, ducted to façade or roof Manual switch on / timer off
Artificial lighting	LED lighting to be provided throughout with dedicated fittings*	
Natural lighting	A window and/or skylight must be installed in the kitchen for natural lighting At least 2 bathroom(s)/toilet(s) must have a window and/or skylight for natural lighting	
Swimming pool	Gas heating is proposed and the pool pump must have a timer installed	
Alternative energy	A photovoltaic system must be installed with a minimum peak capacity of 2.7kW	
Other	Gas cook-top and electric oven to be provided A fixed outdoor clothes drying line must be provide	

*Fittings for those lights must only be capable of accepting LED lamps

Table 5 Energy specification



5.0 APPENDIX A – NATHERS CERTIFICATE



Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Assessor details

Accreditation number: **60787**
Name: **Thau Do**
Organisation: **Umow Lai Pty Ltd**
Email: **thau.do@umowlai.com.au**
Phone: **0398230309**
Declaration of interest: **Employed by designer of the building**
Software: **FirstRate5: 5.2.9 (3.13)**
AAO: **ABSA**

Overview

Dwelling details

Address: **346-352 Whale Beach Road**
Suburb: **Palm Beach**
State: **NSW** Postcode: **2108**
Type: **New Home** NCC Class: **Class 1a**
Lot/DP number: **327-330/DP16362** NatHERS climate zone: **56**
Exposure: **exposed**

Key construction and insulation materials

(see following pages for details)

Construction: Wall: **Insulated masonry cavity**
Roof: **Concrete and metal deck**
Floor: **Concrete**
Insulation: Wall: **R1.9 (insulation value only)**
Roof: **R4.0 (insulation value only)**
Floor: **R2.0 (insulation value only)**
Glazing: **High performance**
Double low-e

Net floor area (m²)

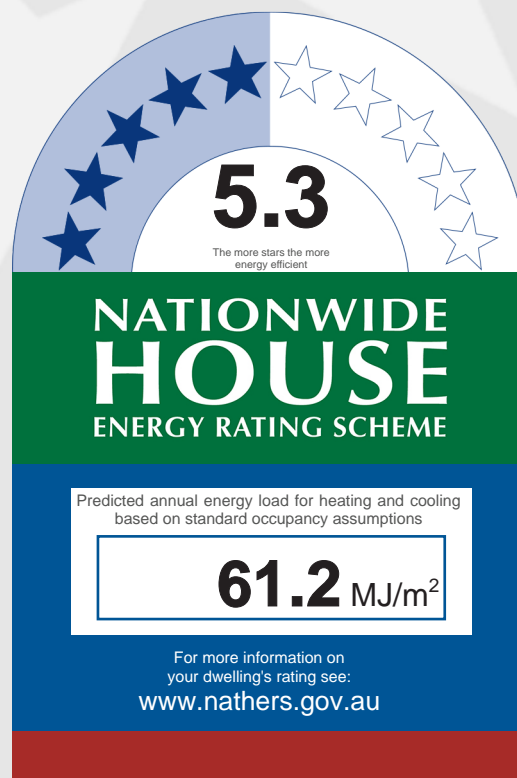
Conditioned: **529.2**
Unconditioned: **10.6**
Garage: **-**
TOTAL: **539.8**

Annual thermal performance loads (MJ/m²)

Heating: **37.6**
Cooling: **23.6**
TOTAL: **61.2**

Plan documents

Plan ref/date: **Project No. 17018**
Prepared by: **Tzannes**



Ceiling penetrations

(see following pages for details)

Sealed: **12**
Unsealed: **0**
TOTAL:** **12**

Principal daylight type: **No downlights modelled**

NOTE: This total is the maximum number of ceiling penetrations allowed to a ceiling (under a roof) for this certificate. **If this number is exceeded in construction then this certificate IS NOT VALID and a new certificate is required. Loss of ceiling insulation for the penetrations listed has been taken into account with the rating.

Window selection - default windows only

Note on allowable window values: Only a 5% tolerance to the nominated SHGC window values shown on page 2 can be used with this rating.

Note: Only a +/-5% SHGC tolerance is allowed with this rating.

NB: This tolerance ONLY applies to SHGC, the U-value can always be lower but not higher than the values stated on page 2.

If any of the windows selected are outside the 5% tolerance then this certificate is no longer valid and the dwelling will need to be rerated to confirm compliance.

Scan to access this certificate online and confirm this is valid.



<https://www.fr5.com.au/QRCodeLand ing?PublicId=4LHR25UG7R>

Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

Windows type and performance value

Window ID	Window type	U-value	SHGC
ALM-004-01 A	Aluminium B DG Air Fill Clear-Clear	4.8	0.59
AWS-067-19 A	RES SERIES 516 FIXED WINDOW DG 11_LightBridge_ClrSI_638-8-5	2.33	0.5

Windows schedule

Window ID	Window no.	Height (mm)	Width (mm)	Orientation	Zone name	Outdoor shade
ALM-004-01 A	Opening 74	2500	2500	ENE	Bedroom 1	No
ALM-004-01 A	Opening 75	2500	2000	SSE	Bedroom 1	No
ALM-004-01 A	Opening 76	2500	1100	SSE	Ensuite 1	No
ALM-004-01 A	Opening 73	2500	2500	ENE	Bedroom 2	No
ALM-004-01 A	Opening 72	2500	1250	NNW	Bedroom 2	No
AWS-067-19 A	Opening 79	2800	5300	WSW	Ground bed hall	No
AWS-067-19 A	Opening 78	2500	1150	SSE	Ground bed hall	No
AWS-067-19 A	Opening 91	2700	4600	ENE	Ground stairs	No
AWS-067-19 A	Opening 92	2700	1200	ENE	Ground stairs	No
AWS-067-19 A	Opening 80	2700	5800	WSW	Ground stairs	No
AWS-067-19 A	Opening 90	2500	2650	SSE	Ground Living	No
AWS-067-19 A	Opening 89	2500	4700	ENE	Ground Living	No
AWS-067-19 A	Opening 88	2500	2650	NNW	Ground Living	No
AWS-067-19 A	Opening 81	2500	4700	WSW	Ground Living	No
ALM-004-01 A	Opening 82	2500	700	WSW	Bath	No
ALM-004-01 A	Opening 83	2500	1000	WSW	L'dry	No
ALM-004-01 A	Opening 87	2500	3200	ENE	Bedroom 3	No
ALM-004-01 A	Opening 86	2500	2000	ENE	Ensuite 3	No
AWS-067-19 A	Opening 84	2500	3150	ENE	Gym	No
AWS-067-19 A	Opening 85	2500	900	ENE	Gym store	No
ALM-004-01 A	Opening 62	2700	2000	SSE	Bedroom 4	No
ALM-004-01 A	Opening 61	2700	3500	ENE	Bedroom 4	No
ALM-004-01 A	Opening 63	2700	1100	SSE	Ensuite 4	No
ALM-004-01 A	Opening 60	2700	3500	ENE	Bedroom 5	No
ALM-004-01 A	Opening 59	2700	2000	NNW	Bedroom 5	No
AWS-067-19 A	Opening 66	2700	5450	WSW	Level 1 bed hall	No
AWS-067-19 A	Opening 65	2700	1000	SSE	Level 1 bed hall	No
AWS-067-19 A	Opening 58	4000	5800	ENE	Level 1 stairs	No
AWS-067-19 A	Opening 67	4000	5800	WSW	Level 1 stairs	No

Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

AWS-067-19 A	Opening 69	4000	2600	NNW	Level 1 glass stairs	No
AWS-067-19 A	Opening 100	2200	4200	SSE	Level 1 glass stairs	No
AWS-067-19 A	Opening 56	3400	4250	ENE	Kitchen/Living	No
AWS-067-19 A	Opening 57	3400	3650	ENE	Kitchen/Living	No
AWS-067-19 A	Opening 54	3400	1000	NNW	Kitchen/Living	No
AWS-067-19 A	Opening 55	3400	4300	NNW	Kitchen/Living	No
AWS-067-19 A	Opening 70	2800	6050	WSW	Kitchen/Living	No
ALM-004-01 A	Opening 71	2800	2150	SSE	Cinema	No
ALM-004-01 A	Opening 53	2700	800	WSW	Level 1 WC	No
AWS-067-19 A	Opening 48	2700	4200	NNW	Level 2 stairs	No
AWS-067-19 A	Opening 47	2700	2500	WSW	Level 2 stairs	No
AWS-067-19 A	Opening 45	2700	1200	SSE	Level 2 stairs	No
AWS-067-19 A	Opening 46	2700	4235	SSE	Level 2 stairs	No
ALM-004-01 A	Opening 44	2700	3000	ENE	Study	No
ALM-004-01 A	Opening 94	1800	3150	WSW	Master bed	No
ALM-004-01 A	Opening 95	1800	2500	WSW	Master bed	No
ALM-004-01 A	Opening 43	2700	3379	ENE	Master bed	No
ALM-004-01 A	Opening 42	2700	3400	NNW	Master bed	No
AWS-067-19 A	Opening 98	800	3800	WSW	Master bed	No
ALM-004-01 A	Opening 40	2700	1200	NNW	Master L'dry	No
ALM-004-01 A	Opening 38	2700	1600	NNW	Master Bath	No
ALM-004-01 A	Opening 52	2700	1200	WSW	Master Bath	No
ALM-004-01 A	Opening 51	1800	800	SSE	Master Bath	No
ALM-004-01 A	Opening 93	1800	800	SSE	Master Bath	No
ALM-004-01 A	Opening 39	2700	800	NNW	Master Bath	No
AWS-067-19 A	Opening 99	700	4300	WSW	Master Bath	No

Roof windows and skylight type and performance value

ID	Window type	U-value	SHGC
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Roof window and skylight schedule

ID	Roof window/ skylight no.	Area (m ²)	Orientation	Zone name	Outdoor shade	Indoor shade/diffuser
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External wall type

Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

Type	Insulation	Wall wrap
1 : STZA0104 - Insulated Brick Cavity	Polystyrene extruded (k = 0.028) (R1.9)	No
2 : TZA-POLI - Cast Concrete - 150mm	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.2)	No

External wall schedule

Wall type	Area (m ²)	Orientation	Zone name	Fixed shade	Eaves
1 : STZA0104 - Insulated Brick Cavity	14	ENE	Bedroom 1	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	11.2	SSE	Bedroom 1	No	Yes
1 : STZA0104 - Insulated Brick Cavity	4.8	SSE	Ensuite 1	No	Yes
1 : STZA0104 - Insulated Brick Cavity	8	WSW	Ensuite 1	Yes	No
1 : STZA0104 - Insulated Brick Cavity	14	ENE	Bedroom 2	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	11.1	NNW	Bedroom 2	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	1.1	NNW	Ensuite 2	Yes	No
1 : STZA0104 - Insulated Brick Cavity	6	ENE	Ground store	Yes	No
1 : STZA0104 - Insulated Brick Cavity	27.1	WSW	Ground bed hall	Yes	No
1 : STZA0104 - Insulated Brick Cavity	6.2	SSE	Ground bed hall	Yes	No
1 : STZA0104 - Insulated Brick Cavity	2.2	SSE	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	3.6	SSE	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	18	ENE	Ground stairs	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	3.6	NNW	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	3.5	ENE	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	3.6	SSE	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	10.2	WSW	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	2.2	NNW	Ground stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	18.1	WSW	Ground stairs	Yes	No
2 : TZA-POLI - Cast Concrete - 150mm	8	SSE	Ground lift	Yes	No
2 : TZA-POLI - Cast Concrete - 150mm	6.7	ENE	Ground lift	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	2.3	SSE	Ground Living	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	2.5	ENE	Ground Living	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	9.1	SSE	Ground Living	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	18.2	ENE	Ground Living	No	Yes
1 : STZA0104 - Insulated Brick Cavity	11	NNW	Ground Living	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	20.5	WSW	Ground Living	Yes	No
1 : STZA0104 - Insulated Brick Cavity	4.8	WSW	Bath	Yes	No
1 : STZA0104 - Insulated Brick Cavity	5.4	WSW	L'dry	Yes	No

Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

1 : STZA0104 - Insulated Brick Cavity	4.6	WSW	Bed 3 WIR	Yes	No
1 : STZA0104 - Insulated Brick Cavity	15.8	ENE	Bedroom 3	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	6.4	ENE	Ensuite 3	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	11.5	ENE	Gym	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	2.1	SSE	Gym store	Yes	No
1 : STZA0104 - Insulated Brick Cavity	5.3	ENE	Gym store	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	13.3	SSE	Bedroom 4	No	Yes
1 : STZA0104 - Insulated Brick Cavity	16.7	ENE	Bedroom 4	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	9.4	WSW	Ensuite 4	Yes	No
1 : STZA0104 - Insulated Brick Cavity	5.7	SSE	Ensuite 4	No	Yes
1 : STZA0104 - Insulated Brick Cavity	16.8	ENE	Bedroom 5	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	13.4	NNW	Bedroom 5	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	2.8	ENE	Ensuite 5	Yes	No
1 : STZA0104 - Insulated Brick Cavity	0.9	NNW	Ensuite 5	Yes	No
1 : STZA0104 - Insulated Brick Cavity	4.4	ENE	Level 1 store	Yes	No
1 : STZA0104 - Insulated Brick Cavity	32.3	WSW	Level 1 bed hall	Yes	No
1 : STZA0104 - Insulated Brick Cavity	7.4	SSE	Level 1 bed hall	Yes	No
1 : STZA0104 - Insulated Brick Cavity	23.3	ENE	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	4.7	NNW	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	3.9	ENE	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	3.7	WSW	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	2.8	NNW	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	23.4	WSW	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	2.8	SSE	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	4.7	SSE	Level 1 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	21.4	NNW	Level 1 glass stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	11.5	WSW	Level 1 glass stairs	No	No
1 : STZA0104 - Insulated Brick Cavity	21.3	SSE	Level 1 glass stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	4.8	SSE	Level 1 glass stairs	Yes	No
2 : TZA-POLI - Cast Concrete - 150mm	11.1	SSE	Level 1 lift	Yes	No
2 : TZA-POLI - Cast Concrete - 150mm	9.4	ENE	Level 1 lift	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	57.4	ENE	Kitchen/Living	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	28.8	NNW	Kitchen/Living	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	31.4	WSW	Kitchen/Living	Yes	No
1 : STZA0104 - Insulated Brick Cavity	17.8	WSW	Cinema	Yes	No

Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

1 : STZA0104 - Insulated Brick Cavity	16.2	SSE	Cinema	Yes	No
1 : STZA0104 - Insulated Brick Cavity	8.3	NNW	Level 1 vanity	No	No
1 : STZA0104 - Insulated Brick Cavity	2.7	ENE	Level 1 vanity	Yes	No
1 : STZA0104 - Insulated Brick Cavity	7.4	NNW	Level 1 WC	No	No
1 : STZA0104 - Insulated Brick Cavity	8.6	WSW	Level 1 WC	Yes	No
1 : STZA0104 - Insulated Brick Cavity	15.4	NNW	Level 2 stairs	Yes	No
1 : STZA0104 - Insulated Brick Cavity	8.5	WSW	Level 2 stairs	No	No
1 : STZA0104 - Insulated Brick Cavity	28.2	SSE	Level 2 stairs	No	No
2 : TZA-POLI - Cast Concrete - 150mm	8.3	SSE	Level 2 lift	No	No
2 : TZA-POLI - Cast Concrete - 150mm	6.9	ENE	Level 2 lift	No	Yes
1 : STZA0104 - Insulated Brick Cavity	11.5	ENE	Study	No	Yes
1 : STZA0104 - Insulated Brick Cavity	23.1	WSW	Master bed	Yes	No
1 : STZA0104 - Insulated Brick Cavity	18.6	ENE	Master bed	No	Yes
1 : STZA0104 - Insulated Brick Cavity	11.9	NNW	Master bed	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	12.6	WSW	Master bed	No	No
1 : STZA0104 - Insulated Brick Cavity	11.9	ENE	Master L'dry	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	9.6	NNW	Master L'dry	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	5.8	NNW	Master Bath	No	No
1 : STZA0104 - Insulated Brick Cavity	20.2	WSW	Master Bath	Yes	No
1 : STZA0104 - Insulated Brick Cavity	12.4	SSE	Master Bath	Yes	No
1 : STZA0104 - Insulated Brick Cavity	6.6	NNW	Master Bath	Yes	Yes
1 : STZA0104 - Insulated Brick Cavity	2.2	ENE	Master Bath	Yes	No
1 : STZA0104 - Insulated Brick Cavity	0.8	NNW	Master Bath	No	No
1 : STZA0104 - Insulated Brick Cavity	0.8	SSW	Master Bath	No	No
1 : STZA0104 - Insulated Brick Cavity	5.7	WSW	Master Bath	No	No

Internal wall type

Type	Area (m ²)	Insulation
1 : STZA0104 - Single Brick	348	
2 : TZA-POLI - Cast Concrete - 150mm	43.7	Glass fibre batt (k = 0.044 density = 12 kg/m3) (R1.2)
3 : STZA0104 - Insulated Brick Cavity	46.1	Polystyrene extruded (k = 0.028) (R1.9)

Floors

Location	Construction	Area (m ²)	Sub floor ventilation	Added insulation	Covering
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Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

Bedroom 1	CSOG: Slab on Ground	8.7	Enclosed	1.0	Carpet
Bedroom 1	SuspSlab : 200mm: 200mm concrete slab	9.9	Enclosed	2.0	Carpet
Ensuite 1	CSOG: Slab on Ground	4.3	Enclosed	1.0	Tiles
Bedroom 2	SuspSlab : 200mm: 200mm concrete slab	18.9	Enclosed	2.0	Carpet
Ensuite 2	SuspSlab : 200mm: 200mm concrete slab	3.6	Enclosed	2.0	Tiles
Ensuite 2	CSOG: Slab on Ground	0.5	Enclosed	1.0	Tiles
Ground store	CSOG: Slab on Ground	0.8	Enclosed	1.0	Tiles
Ground store	SuspSlab : 200mm: 200mm concrete slab	1.6	Enclosed	2.0	Tiles
Ground bed hall	CSOG: Slab on Ground	14	Enclosed	1.0	Tiles
Ground stairs	CSOG: Slab on Ground	21.2	Enclosed	1.0	Tiles
Ground stairs	SuspSlab : 200mm: 200mm concrete slab	16.5	Enclosed	2.0	Tiles
Ground lift	CSOG: Slab on Ground	5.5	Enclosed	1.0	Tiles
Ground Living	CSOG: Slab on Ground	41.5	Enclosed	1.0	Tiles
Ground Living	CSOG: Slab on Ground	20.1	Enclosed	1.0	Tiles
Ground Living	SuspSlab : 200mm: 200mm concrete slab	3.5	Enclosed	2.0	Tiles
Bath	CSOG: Slab on Ground	2.4	Enclosed	1.0	Tiles
L'dry	CSOG: Slab on Ground	4.8	Enclosed	1.0	Tiles
Ground hall	CSOG: Slab on Ground	1.6	Enclosed	1.0	Tiles
Bed 3 WIR	CSOG: Slab on Ground	4.1	Enclosed	1.0	Carpet
Bedroom 3	CSOG: Slab on Ground	19.5	Enclosed	1.0	Carpet
Ensuite 3	CSOG: Slab on Ground	8	Enclosed	1.0	Tiles
Ensuite 3	CSOG: Slab on Ground	1.9	Enclosed	1.0	Tiles
Gym WC	CSOG: Slab on Ground	1.7	Enclosed	1.0	Tiles
Gym	CSOG: Slab on Ground	15.6	Enclosed	1.0	Tiles
Gym store	CSOG: Slab on Ground	2.7	Enclosed	1.0	Tiles
Bedroom 4	SuspSlab : 150mm: 150mm concrete slab	18.9	Enclosed	0.0	Carpet
Ensuite 4	SuspSlab : 150mm: 150mm concrete slab	4.3	Enclosed	0.0	Tiles
Bedroom 5	SuspSlab : 150mm: 150mm concrete slab	19	Enclosed	0.0	Carpet
Ensuite 5	SuspSlab : 150mm: 150mm concrete slab	5.3	Enclosed	0.0	Tiles

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Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Building Features

Level 1 store	SuspSlab : 150mm: 150mm concrete slab	1.6	Enclosed	0.0	Tiles
Level 1 bed hall	SuspSlab : 150mm: 150mm concrete slab	14.1	Enclosed	0.0	Tiles
Level 1 stairs	SuspSlab : 150mm: 150mm concrete slab	29.5	Enclosed	0.0	Tiles
Level 1 glass stairs	SuspSlab : 150mm: 150mm concrete slab	10.7	Enclosed	0.0	Tiles
Level 1 glass stairs	CSOG: Slab on Ground	5.9	Enclosed	1.0	Tiles
Level 1 glass stairs	SuspSlab : 150mm: 150mm concrete slab	6.6	Elevated	2.0	Tiles
Level 1 lift	SuspSlab : 150mm: 150mm concrete slab	5.7	Enclosed	0.0	Tiles
Kitchen/Living	SuspSlab : 150mm: 150mm concrete slab	71.6	Enclosed	0.0	Tiles
Kitchen/Living	CSOG: Slab on Ground	2.1	Enclosed	1.0	Tiles
Kitchen/Living	SuspSlab : 150mm: 150mm concrete slab	13	Enclosed	0.0	Tiles
Cinema	CSOG: Slab on Ground	11.3	Enclosed	1.0	Tiles
Cinema	SuspSlab : 150mm: 150mm concrete slab	4.1	Elevated	2.0	Tiles
Level 1 vanity	CSOG: Slab on Ground	3.1	Enclosed	1.0	Tiles
Level 1 vanity	CSOG: Slab on Ground	0.8	Enclosed	1.0	Tiles
Level 1 WC	CSOG: Slab on Ground	3.5	Enclosed	1.0	Tiles
Level 2 stairs	SuspSlab : 150mm: 150mm concrete slab	23.2	Enclosed	0.0	Tiles
Level 2 lift	SuspSlab : 150mm: 150mm concrete slab	5.6	Enclosed	0.0	Tiles
Study	SuspSlab : 150mm: 150mm concrete slab	15.8	Enclosed	0.0	Tiles
Master bed	SuspSlab : 150mm: 150mm concrete slab	11.6	Enclosed	0.0	Carpet
Master bed	SuspSlab : 150mm: 150mm concrete slab	14.4	Enclosed	0.0	Carpet
Master bed	SuspSlab : 150mm: 150mm concrete slab	18.8	Enclosed	0.0	Carpet
Master L'dry	SuspSlab : 150mm: 150mm concrete slab	11.1	Enclosed	0.0	Tiles
Master Bath	SuspSlab : 150mm: 150mm concrete slab	11.6	Enclosed	0.0	Tiles
Master Bath	SuspSlab : 150mm: 150mm concrete slab	11.3	Enclosed	0.0	Tiles

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★ Star rating: 5.3



Building Features

Ceiling type

Location	Material	Added insulation	Roof space above
Bedroom 1	Plasterboard	0.0	No
Bedroom 1	Plasterboard	0.0	No
Ensuite 1	Plasterboard	0.0	No
Bedroom 2	Plasterboard	0.0	No
Ensuite 2	Plasterboard	0.0	No
Ensuite 2	Plasterboard	0.0	No
Ground store	Plasterboard	0.0	No
Ground store	Plasterboard	0.0	No
Ground store	Plasterboard	0.0	No
Ground store	Plasterboard	0.0	No
Ground bed hall	Plasterboard	0.0	No
Ground stairs	Plasterboard	0.0	No
Ground stairs	Plasterboard	0.0	No
Ground stairs	Plasterboard	0.0	No
Ground stairs	Plasterboard	0.0	No
Ground lift	Plasterboard	0.0	No
Ground Living	Plasterboard	0.0	No
Ground Living	Plasterboard	0.0	No
Ground Living	Plasterboard	4.0	No
Ground Living	Plasterboard	0.0	No
Ground Living	Plasterboard	0.0	No
Bath	Plasterboard	0.0	No
L'dry	Plasterboard	0.0	No
Ground hall	Plasterboard	0.0	No
Bed 3 WIR	Plasterboard	0.0	No
Bedroom 3	Plasterboard	0.0	No
Bedroom 3	Plasterboard	0.0	No
Ensuite 3	Plasterboard	0.0	No
Ensuite 3	Plasterboard	0.0	No
Ensuite 3	Plasterboard	4.0	No
Gym WC	Plasterboard	4.0	No
Gym	Plasterboard	4.0	No
Gym store	Plasterboard	4.0	No

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Building Features

Bedroom 4	Plasterboard	4.0	No
Ensuite 4	Plasterboard	4.0	No
Bedroom 5	Plasterboard	4.0	No
Ensuite 5	Plasterboard	4.0	No
Level 1 store	Plasterboard	4.0	No
Level 1 bed hall	Plasterboard	4.0	No
Level 1 stairs	Plasterboard	4.0	No
Level 1 glass stairs	Plasterboard	0.0	No
Level 1 glass stairs	Plasterboard	0.0	No
Level 1 glass stairs	Plasterboard	0.0	No
Level 1 lift	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	0.0	No
Kitchen/Living	Plasterboard	4.0	No
Cinema	Plasterboard	0.0	No
Cinema	Plasterboard	0.0	No
Cinema	Plasterboard	0.0	No
Level 1 vanity	Plasterboard	0.0	No
Level 1 vanity	Plasterboard	4.0	No
Level 1 WC	Plasterboard	0.0	No
Level 1 WC	Plasterboard	0.0	No
Level 2 stairs	Plasterboard	4.0	No
Level 2 lift	Plasterboard	4.0	No
Study	Plasterboard	4.0	Yes
Master bed	Plasterboard	4.0	No
Master bed	Plasterboard	4.0	No
Master bed	Plasterboard	4.0	No
Master L'dry	Plasterboard	4.0	No
Master Bath	Plasterboard	4.0	No
Master Bath	Plasterboard	4.0	No

Ceiling penetrations

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Building Features

Location	Number	Type	Width (mm)	Length (mm)	Seal/ unsealed
Ensuite 1	1	Exhaust Fans	200	200	Sealed
Ensuite 2	1	Exhaust Fans	200	200	Sealed
Ground Living	1	Exhaust Fans	200	200	Sealed
Bath	1	Exhaust Fans	200	200	Sealed
L'dry	1	Exhaust Fans	200	200	Sealed
Ensuite 3	1	Exhaust Fans	200	200	Sealed
Ensuite 4	1	Exhaust Fans	200	200	Sealed
Ensuite 5	1	Exhaust Fans	200	200	Sealed
Kitchen/Living	1	Exhaust Fans	200	200	Sealed
Level 1 WC	1	Exhaust Fans	200	200	Sealed
Master L'dry	1	Exhaust Fans	0	0	Sealed
Master Bath	1	Exhaust Fans	200	200	Sealed

Ceiling fans

Location	Number	Diameter (mm)
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Roof type

Material	Added insulation	Roof colour
Slab:Slab - Suspended Slab : 150mm: 150mm Suspended Slab	0.0	medium
Framed:Flat - Flat Framed (Metal Deck)	0.0	medium
Cont:Attic-Continuous	0.0	medium

Nationwide House Energy Rating Scheme* Certificate

Certificate Number: 4LHR25UG7R

Date of Certificate: 1 Mar 2019

★ Star rating: 5.3



Additional information

Explanatory notes

About this report

Residential energy ratings address the quality of the building fabric i.e. walls, windows, floors and roof/ceilings. Ratings do not cover the energy or water efficiency of appliances including heating and cooling, hot water, dishwashers, ovens, fridges, TVs etc. or solar panel or water tank requirements. The efficiency or specification of these items is generally covered by other regulations, standards or guidelines.

General Information

A NatHERS House Energy Rating is a comprehensive, dynamic computer modelling evaluation of the floorplans, elevations and specifications to predict an energy load of a home. Not all of us use our homes in the same way, so ratings are generated using standard assumptions. This means homes can be compared across the country.

The actual energy consumption of your home may vary significantly from the predicted energy load figures in this report depending on issues such as the size of your household and your personal preferences, e.g. in terms of heating or cooling.

While the figures are an indicative guide to energy use, they can be used as a reliable guide for comparative purposes between different house designs and for demonstrating that the design meets the required regulatory compliance.

Homes that are energy efficient use less energy, are warmer in winter, cooler in summer and cost less to run. The higher the star rating the more energy efficient.

This NatHERS House Energy Rating report was carefully prepared by your assessor on the basis of comprehensive modelling using standard procedures to rate your home using an underlying engine developed by the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO).

All information relating to energy loads presented in this report is based on a range of standard assumptions in order to allow for comparisons with reports prepared for other homes and to demonstrate minimum regulatory compliance. The standard assumptions include figures for occupancy, indoor air temperature and are based on a unique climate file for your region.

Accredited Assessors

To ensure you get a high-quality, professional NatHERS House Energy Rating report, you should always use an accredited assessor, accredited assessors are members of a professional body called an Assessor Accrediting Organisation (AAO).

AAOs have specific quality assurance processes in place and continuing professional development requirements to maintain a high and consistent standard of assessments across the country. Non-accredited assessors do not have this level of quality assurance or any on-going training requirements.

If you have any questions or concerns about this report, please direct them to your assessor in the first instance.

If your assessor is unable to address your questions or concerns, please contact their AAO listed under 'assessor details'. You can also find a range of information about accredited assessors on the AAO websites.

Disclaimer

The energy values quoted are for comparison purposes only; they are not a prediction of actual energy use. This rating only applies to the floor plan, construction details, orientation and climate as submitted and included in the attached drawing set that bears a stamp with the same number as this certificate. Changes to any of these details could affect the rating.

Contact

For more information on the Nationwide House Energy Rating Scheme (NatHERS), visit www.nathers.gov.au

For more information on energy efficient design and insulation visit www.yourhome.gov.au

6.0 APPENDIX B – BASIX CERTIFICATE



BASIX[®]Certificate

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

Single Dwelling

Certificate number: 966238S

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

Secretary

Date of issue: Friday, 01 March 2019

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



Project summary

Project name	Palm Beach Residence
Street address	346-352 Whale Beach Road Palm Beach 2108
Local Government Area	Northern Beaches Council
Plan type and plan number	deposited DP16362
Lot no.	327
Section no.	Null
Project type	separate dwelling house
No. of bedrooms	6

Project score

Water	✓ 40	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 50	Target 50

Certificate Prepared by

Name / Company Name: Umow Lai NSW Pty Ltd

ABN (if applicable): 80143565324

Description of project

Project address

Project name	Palm Beach Residence
Street address	346-352 Whale Beach Road Palm Beach 2108
Local Government Area	Northern Beaches Council
Plan type and plan number	Deposited Plan DP16362
Lot no.	327
Section no.	Null

Project type

Project type	separate dwelling house
No. of bedrooms	6

Site details

Site area (m ²)	2270
Roof area (m ²)	404
Conditioned floor area (m2)	529.2
Unconditioned floor area (m2)	10.6
Total area of garden and lawn (m2)	120

Assessor details and thermal loads

Assessor number	1682
Certificate number	4LHR25UG7R
Climate zone	56
Area adjusted cooling load (MJ/m ² .year)	24
Area adjusted heating load (MJ/m ² .year)	38

Project score

Water	✓ 40	Target 40
Thermal Comfort	✓ Pass	Target Pass
Energy	✓ 50	Target 50

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.

Water Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Fixtures			
The applicant must install showerheads with a minimum rating of 3 star (> 7.5 but <= 9 L/min) in all showers in the development.		✓	✓
The applicant must install a toilet flushing system with a minimum rating of 4 star in each toilet in the development.		✓	✓
The applicant must install taps with a minimum rating of 4 star in the kitchen in the development.		✓	
The applicant must install basin taps with a minimum rating of 4 star in each bathroom in the development.		✓	
Alternative water			
Rainwater tank			
The applicant must install a rainwater tank of at least 6500 litres on the site. This rainwater tank must meet, and be installed in accordance with, the requirements of all applicable regulatory authorities.	✓	✓	✓
The applicant must configure the rainwater tank to collect rain runoff from at least 150 square metres of the roof area of the development (excluding the area of the roof which drains to any stormwater tank or private dam).		✓	✓
The applicant must connect the rainwater tank to: <ul style="list-style-type: none"> all toilets in the development at least one outdoor tap in the development (Note: NSW Health does not recommend that rainwater be used for human consumption in areas with potable water supply.) a tap that is located within 10 metres of the swimming pool in the development 		✓ ✓ ✓	✓ ✓ ✓
Swimming pool			
The swimming pool must not have a volume greater than 50 kilolitres.	✓	✓	
The swimming pool must have a pool cover.		✓	

Water Commitments

Show on
DA plans

Show on CC/CDC
plans & specs

Certifier
check

The swimming pool must be outdoors.



Thermal Comfort Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Simulation Method			
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 an occupation certificate for the proposed development.			
The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.			
The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX certificate, including the Cooling and Heating loads shown on the front page of this certificate.			
The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Assessor Certificate 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. 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.	✓	✓	✓
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.		✓	✓
The applicant must construct the floors and walls of the dwelling in accordance with the specifications listed in the table below.	✓	✓	✓

Floor and wall construction	Area
floor - concrete slab on ground	206.0 square metres
floor - suspended floor/open subfloor	11.0 square metres
floor - suspended floor/enclosed subfloor	54.0 square metres

Energy Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
Hot water			
The applicant must install the following hot water system in the development, or a system with a higher energy rating: gas storage with a performance of 5 stars.	✓	✓	✓
Cooling system			
The applicant must install the following cooling system, or a system with a higher energy rating, in at least 1 living area: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✓	✓
The applicant must install the following cooling system, or a system with a higher energy rating, in at least 1 bedroom: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✓	✓
Heating system			
The applicant must install the following heating system, or a system with a higher energy rating, in at least 1 living area: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✓	✓
The applicant must install the following heating system, or a system with a higher energy rating, in at least 1 bedroom: 3-phase airconditioning; Energy rating: EER 3.0 - 3.5		✓	✓
Ventilation			
The applicant must install the following exhaust systems in the development:			
At least 1 Bathroom: individual fan, ducted to façade or roof; Operation control: manual on / timer off		✓	✓
Kitchen: individual fan, ducted to façade or roof; Operation control: manual switch on/off		✓	✓
Laundry: individual fan, ducted to façade or roof; Operation control: manual on / timer off		✓	✓
Artificial lighting			
The applicant must ensure that the "primary type of artificial lighting" is fluorescent or light emitting diode (LED) lighting in each of the following rooms, and where the word "dedicated" appears, the fittings for those lights must only be capable of accepting fluorescent or light emitting diode (LED) lamps:			
• at least 6 of the bedrooms / study; dedicated		✓	✓
• at least 3 of the living / dining rooms; dedicated		✓	✓
• the kitchen; dedicated		✓	✓

Energy Commitments	Show on DA plans	Show on CC/CDC plans & specs	Certifier check
<ul style="list-style-type: none"> all bathrooms/toilets; dedicated 		✓	✓
<ul style="list-style-type: none"> the laundry; dedicated 		✓	✓
<ul style="list-style-type: none"> all hallways; dedicated 		✓	✓
Natural lighting			
The applicant must install a window and/or skylight in the kitchen of the dwelling for natural lighting.	✓	✓	✓
The applicant must install a window and/or skylight in 2 bathroom(s)/toilet(s) in the development for natural lighting.	✓	✓	✓
Swimming pool			
The applicant must install the following heating system for the swimming pool in the development (or alternatively must not install any heating system for the swimming pool): gas		✓	
The applicant must install a timer for the swimming pool pump in the development.		✓	
Alternative energy			
The applicant must install a photovoltaic system with the capacity to generate at least 2.7 peak kilowatts of electricity as part of the development. The applicant must connect this system to the development's electrical system.	✓	✓	✓
Other			
The applicant must install a gas cooktop & electric oven in the kitchen of the dwelling.		✓	
The applicant must install a fixed outdoor clothes drying line as part of the development.		✓	

Legend

In these commitments, "applicant" means the person carrying out the development.

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).

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.

Commitments identified with a  in the "Certifier check" column must be certified by a certifying authority as having been fulfilled, before a final occupation certificate (either interim or final) for the development may be issued.