Roche Group Pty Ltd

Harrington Waters Estate – Site B

BASIX Assessment Report

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Date	26/08/2021
Revision	02 – Updated scheme
Subject	Harrington Waters Estate – Site B – BASIX Assessment Report

1. SITE APPRECIATION

The proposed development is located at Josephine Boulevard, Harrington Waters and consists of:

- 40 new residential units

2. BASIX WATER SECTION

The proposed development will meet the mandatory BASIX water target of 40% as long as the water commitments detailed in Table 1 are installed. For details of the requirements necessary to achieve this target, please refer to the BASIX Certificate No. 953894M_03.

Table 1: BASIX Water Commitments

Common Areas and Central Systems	
Area of Indigenous or low water species	• **See Appendix B**
Rainwater collection	• 6,500L rainwater tank • Roof collection area – 1,000m^2 • Rainwater to be used for Common area & private area landscape irrigation
Outdoor swimming pool	• Maximum volume of 92.4 kL
Outdoor spa	• None
Private Dwellings	
Fixtures for apartments	• 3-star (Water Rating) showerheads with a flow rate > 6.0L/min & ≤ 7.5L/min • 4-star (Water Rating) toilets • 5-star (Water Rating) kitchen taps • 5-star (Water Rating) bathroom taps • 5.5-star (Water Rating) dishwashers

3. BASIX THERMAL COMFORT SECTION

The thermal performance of the development has been evaluated using BERS Pro 2nd Generation software. The BERS Pro computer simulation of residential developments forms part of the Nationwide House Energy Rating Scheme, and is used to assess the potential of a residential development to have low heating and cooling energy requirements once operational.

3.1 MODELLING ASSUMPTIONS

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

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

Table 2: Base Case Assumptions on Construction and Fabric

Element	*Material*	*Detail*
External walls	Brick Veneer	**Insulation: See Table 3**
		Light colour: Absorptance< 0.475
	Metal cladding	**Insulation: See Table 3**
		Medium colour: 0.475<absorptance< 0.7
Internal walls	Plasterboard	
Party walls	Cavity Brick	Common corridors
	Cavity Brick	Neighbour
	Concrete Block	Fire stairs & lifts
Windows	**Type 1**	Total Window System Properties U-value 6.7 & SHGC 0.70 **for sliding doors, sliding & fixed windows** **OR** Total Window System Properties U-value 6.7 & SHGC 0.57 **for awning windows**
	Type 2	Total Window System Properties U-value 5.6 & SHGC 0.41 **for sliding doors, sliding & fixed windows** **OR** Total Window System Properties U-value 5.6 & SHGC 0.36 **for awning windows**
	Window Operability	Balcony windows: **45% & 0% (i.e. sliding or fixed)** Bedroom windows: **10%** (BCA D2.24) All other non-balcony windows: **0% & 90% (i.e. fixed & awnings)**
	Shading device	None
Skylight	**Type 2**	Total Window System Properties U-value 5.6 & SHGC 0.41
Roof	Concrete	**Insulation: None**
		Light colour: Absorptance< 0.3
Ceilings	Plasterboard	**Insulation: See Table 3**
Floors	Concrete	**Insulation: See Table 3**
		Tiles: Wet areas only
		Carpet: Bedrooms
		Tiles: Living areas
Common corridors naturally ventilated		No
Recessed downlights assessed		No
Exhaust fans (kitchens, bathrooms, laundry)		**All assumed to be sealed**

3.2 BERS PRO RESULTS (THERMAL COMFORT)

The simulated heating and cooling loads per dwelling are summarized in Table 3 below. Where the dwellings have failed to meet the thermal load targets additional thermal enhancements / treatments are provided. This is typically in the form of bulk insulation. These additional thermal treatments are required to pass the BASIX Thermal performance requirements. Please refer to BASIX Certificate No. 953894M_03 & NatHERS Universal Certificate No. 0003783010 for details.

Table 3: BERS Pro Thermal Loads

Unit No.	*Additional Treatments Required*	*Heating Load (MJ/m².yr)*	*Cooling Load (MJ/m².yr)*	*Stars*	*Pass/Fail*
1	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, East Bedroom windows to have at least 10% ventilation opening	21.3	33.7	6.7	Pass
2	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	12.9	22.4	7.9	Pass
3	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	23.9	29.9	6.8	Pass
4	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening, West Living window to have at least 20% ventilation opening	37.2	30.0	5.9	Pass
5	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening	34.4	26.0	6.4	Pass
6	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, West Living window to have at least 20% ventilation opening, West Main Bedroom window to have at least 10% ventilation opening	33.8	35.1	5.9	Pass
7	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	50.9	22.6	5.7	Pass
8	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	32.5	19.4	6.9	Pass
9	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	43.5	27.8	5.8	Pass

Unit No.	*Additional Treatments Required*	*Heating Load (MJ/m².yr)*	*Cooling Load (MJ/m².yr)*	*Stars*	*Pass/Fail*
10	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	16.3	36.2	6.9	Pass
11	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	37.3	34.0	5.8	Pass
12	R1.0 Bulk Floor Insulation adjacent to carpark (total floor system R-value of Rt1.61), R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	54.7	26.7	5.3	Pass
13	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening	8.0	32.6	7.6	Pass
14	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	4.1	25.3	8.3	Pass
15	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	14.1	32.5	7.3	Pass
16	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening, West Living window to have at least 20% ventilation opening	16.9	33.6	6.9	Pass
17	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening	14.8	29.2	7.4	Pass
18	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, West Living window to have at least 20% ventilation opening, West Main Bedroom window to have at least 10% ventilation opening	20.2	32.4	6.9	Pass
19	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	29.5	24.4	6.8	Pass
20	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	12.8	23.1	7.9	Pass
21	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56), North Living window to have at least 10% ventilation opening	34.6	34.3	5.9	Pass
22	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56), North Living window to have at least 10% ventilation opening, East Bedroom window to have at least 10% ventilation opening	17.2	35.4	6.9	Pass
23	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56), South Living window to have at least 10% ventilation opening, East Bedroom window to have at least 10% ventilation opening, Type 2 skylights	32.1	36.1	5.9	Pass
24	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling	45.8	33.8	5.4	Pass

Unit No.	Additional Treatments Required	Heating Load (MJ/m².yr)	Cooling Load (MJ/m².yr)	Stars	Pass/Fail
	Insulation (total ceiling/roof system R-value Rt2.56), South Living window to have at least 10% ventilation opening, West Bedroom window to have at least 10% ventilation opening, Type 2 skylights				
25	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening	8.6	32.1	7.6	Pass
26	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	4.8	25.1	8.3	Pass
27	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	15.0	31.6	7.3	Pass
28	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening, West Living window to have at least 20% ventilation opening	17.9	33.3	6.9	Pass
29	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening	15.9	28.3	7.4	Pass
30	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, West Living window to have at least 20% ventilation opening, West Main Bedroom window to have at least 10% ventilation opening	21.3	31.0	6.9	Pass
31	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	30.8	24.0	6.7	Pass
32	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows	13.3	23.2	7.9	Pass
33	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)	23.3	31.6	6.7	Pass
34	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)	15.8	25.5	7.6	Pass
35	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)	29.3	27.9	6.6	Pass
36	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening, West Living window to have at least 20% ventilation opening, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)	38.7	31.2	5.9	Pass
37	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only, Type 2 to all other windows, East Bedroom windows to have at least 10% ventilation opening, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)	36.0	25.9	6.3	Pass
38	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 to louvred window only,	40.9	28.5	5.9	Pass

Unit No.	*Additional Treatments Required*	*Heating Load (MJ/m².yr)*	*Cooling Load (MJ/m².yr)*	*Stars*	*Pass/Fail*
	Type 2 to all other windows, West Living window to have at least 20% ventilation opening, West Main Bedroom window to have at least 10% ventilation opening, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)				
39	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56), Type 2 skylight	40.6	33.0	5.7	Pass
40	R2.0 Bulk External Wall Insulation (total wall system R-value of Rt2.52), Type 1 windows, R2.5 Bulk Ceiling Insulation (total ceiling/roof system R-value Rt2.56)	21.7	26.9	7.1	Pass

4. BASIX ENERGY SECTION

The proposed development will meet the mandatory BASIX Energy target of 30% as long as the energy commitments detailed in Table 4 are installed.

Table 4: BASIX Energy Commitments

Component		*Commitment*
Common Areas and Central Systems	Hot Water System	• Centralised Electric Heat Pump (Air Sourced) HWS with internal piping insulation of R1.0 (~38mm)
	Lifts	• All lifts to use Gearless traction with VVVF motor servicing all levels
	Ventilation	• Car park: Ventilation (supply & exhaust) with a CO monitor & VSD fan • Lift Motor Rooms: Ventilation (exhaust only), thermostatically controlled • Switch Room: Ventilation (Supply only), thermostatically controlled • Garbage Rooms: Ventilation (exhaust only) • Plant/Service Rooms: Ventilation (exhaust only), thermostatically controlled • Hallways & lobbies: Ventilation (supply only) connected to time clock or BMS
	Lighting	• Car park: Fluorescent lighting with motion sensors • Lift Cars: LED lighting connected to lift call button • Garbage Rooms: LED lighting with motion sensors • Plant/Service Room, Lift motor rooms & Switch Rooms: LED lighting with manual on/off switch • Hallways & lobbies: LED lighting with motion sensors + time clock
	Outdoor Swimming pool	• No heating • Pump will be controlled by a timer
	Outdoor Spa	• No Spa
	Alternative Energy Supply	• **Photovoltaic system of rated electrical output of 29.5 kW peak** • **Panel area is approximately 188.8 m² [1]**
Private Dwellings	Hot Water System	• See Central Systems
	Ventilation	• Kitchen Exhaust, Bathroom & Laundry Exhaust: Individual fan, ducted to roof or façade, with manual on/off switch
	Heating & Cooling	• Heating: Living & Beds to have individual 2.5-star (New Rating) 1-phase air-conditioning • Cooling: Living & Beds to have individual 2.5-star (New Rating) 1 phase air-conditioning • **Air conditioning to be day-night zoned between bedrooms and living areas**

[1] Based on using 250W panel with an approximate panel area of 1.6m²

Component		Commitment
	Lighting	• At least 80% of light fittings (including the main light fitting) in all hallways, laundries, bathrooms, kitchens, bedrooms and living areas to use Fluorescent or LED lights with dedicated fittings[2]
	Other	• Electric cook top and electric oven • Install 4-star (Energy Rating) dishwasher • Install 2-star (Energy Rating) dryer • Install Indoor or sheltered clothes drying line (e.g.: screened line on balcony, line over bath, etc)

5. CONCLUSION

The proposed development has been assessed to optimise its thermal performance (passive and fabric design) using the Nationwide House Energy Rating scheme (NatHERS) and also been assessed in terms of its ability to conserve water and minimise energy consumption through BASIX Tool.

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

For further details, please refer to the BASIX Certificate No. 953894M_03 provided.

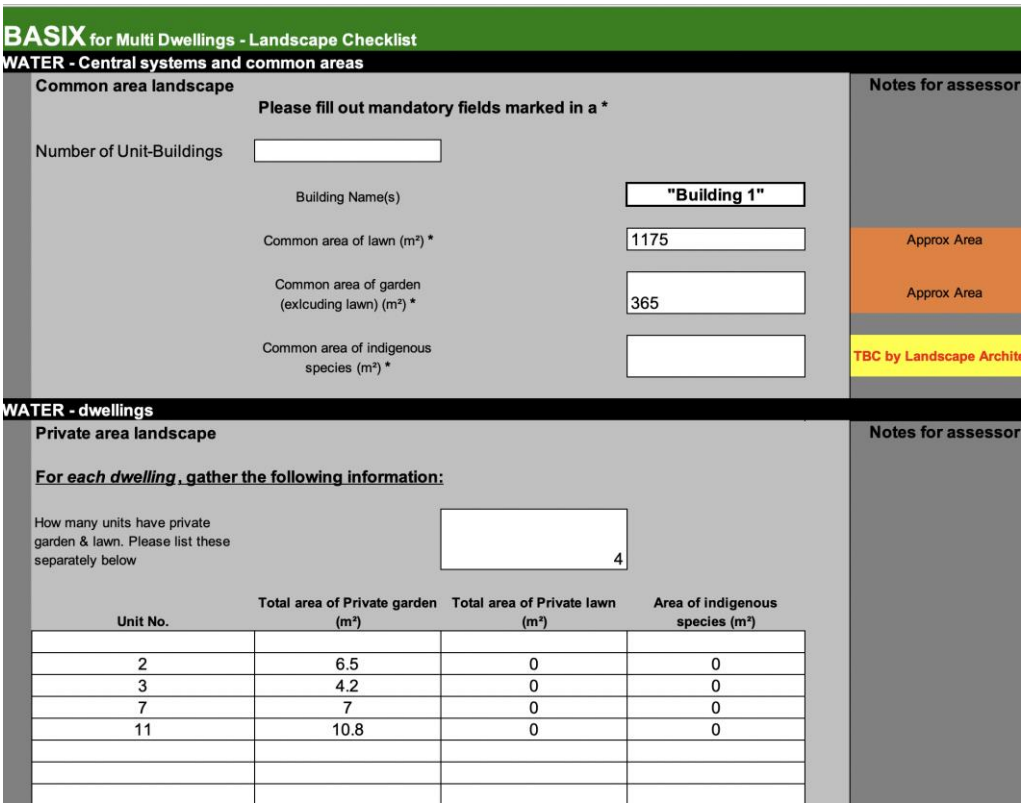
APPENDIX A - ARCHITECTURAL DRAWINGS

The building sustainability performance assessment carried out in this report was based on the following architectural drawings supplied by BKA Architecture received on 20th August 2021.

Dwg. No	Dwg. Name	Scale
A000	Cover Page	
A001	Location Plan	1:450
A002	Site Plan	1:200
A100	Basement Plan	1:200
A101	Ground Level Plan	1:200
A102	Level 01 Plan	1:200
A103	Level 02 Plan	1:200
A104	Level 03 Plan	1:200
A105	Roof Plan	1:200
A201	Elevations - Sheet 01	1:200
A202	Elevations - Sheet 02	1:200
A301	Sections - Sheet 01	1:200
A700	Solar Access Diagram - Sheet 01	1:300
A701	Solar Access Diagram - Sheet 02	1:300
A710	Height Plane Diagram	
A720	Cross Ventilation Diagram	1:100
A750	GFA Diagram	1:500
A900	Materials and Finishes	1:200
A950	Perspective Image	

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

APPENDIX B – Landscaping Areas



BASIX for Multi Dwellings - Landscape Checklist

WATER - Central systems and common areas

Common area landscape

Please fill out mandatory fields marked in a *

		Notes for assessor
Number of Unit-Buildings		
Building Name(s)	"Building 1"	
Common area of lawn (m²) *	1175	Approx Area
Common area of garden (exlcuding lawn) (m²) *	365	Approx Area
Common area of indigenous species (m²) *		TBC by Landscape Archit

WATER - dwellings

Private area landscape — Notes for assessor

For *each dwelling*, gather the following information:

How many units have private garden & lawn. Please list these separately below: 4

Unit No.	Total area of Private garden (m²)	Total area of Private lawn (m²)	Area of indigenous species (m²)
2	6.5	0	0
3	4.2	0	0
7	7	0	0
11	10.8	0	0