

Mirvac Projects Pty Ltd

7 Railway St, Chatswood

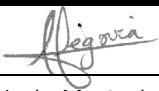

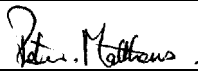
BASIX Assessment



Report No. 20C-10-0128-TRP-461887-7

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## EXECUTIVE SUMMARY

VIPAC Engineers & Scientists Ltd. has been commissioned by Mirvac Projects Pty Ltd to assess the interaction of the proposed 7 Railway St, Chatswood development with the local environment in terms of BASIX compliance.

The proposed development comprises of:

- 7 levels of basement car parking.
- 295 Apartments over 37 levels.
- 5 levels of dedicated commercial spaces.
- Commercial & retail spaces on Ground floor.

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

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

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

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## 1. INTRODUCTION

BASIX is a web-based planning tool designed to assess the potential performance of new homes against a range of sustainability issues including Landscape, Stormwater, Water, Thermal Comfort and Energy. BASIX aims to reduce the environmental impact of these features of new residential housing and therefore will produce homes that are more comfortable and cheaper to run than most existing homes.

BASIX focuses on reducing Water and Energy use. Landscape, Stormwater and Thermal Comfort indices are also included in the assessment as information relating to these attributes impacts on water consumption and greenhouse gas emissions. BASIX has set targets so that each new residential development will use less drinking-quality water and produce less greenhouse gas emissions than average NSW homes of the same type (20% for developments of 6 storeys or over).

BERS Pro is Australian designed 2<sup>nd</sup> Generation software used for assessing the thermal performance of residential units and houses. 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 energy requirements once operational.

## 2. WATER

The proposed 7 Railway St, Chatswood development has met the mandatory BASIX water target of 40%. For details of the requirements necessary to achieve this target, please refer to the BASIX Certificate Nos. 348978M, 348979M, 348980M and 348983M.

Requirements:

- A total area of 1,000m<sup>2</sup> must be indigenous or low water use species.
- 50,000L rainwater tank collecting from 100% of the total roof area. Water collected will be used for: apartments toilet flushing for Levels 5 to 14 only.
- Pool size: 72kL.
- Common area facilities must install: 3-star (Water Rating)<sup>1</sup> showerheads, 3-star (Water Rating) toilets, 4-star (Water rating) taps.
- Apartments must install:
  - 3-star (Water Rating)<sup>2</sup> showerheads, 4-star (Water Rating) toilets, 4-star (Water rating) taps for kitchen & bathrooms.
  - 4-star (Water rating) Clothes Washers.
  - 3-star (Water rating) Dishwashers.

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<sup>1</sup> Greater than 7.5L/min but less than or equal to 9L/min

<sup>2</sup> Greater than 7.5L/min but less than or equal to 9L/min

### 3. THERMAL COMFORT

#### 3.1 BERS PRO MODELLING ASSUMPTIONS

BERS Pro calculates the transient hourly heat gains and losses for each space inside a building taking into account the building's thermal storage, typical residential operational schedules and hourly weather data.

The "base-case" modelled materials of construction for the development are described in Table 1. Building geometry and orientation were modelled according to supplied drawings.

Table 1: Construction Materials - BERS Pro Model

Element	Material	Detail
External walls	Concrete Block, lined	Insulation: See Table 2
		Light colour: absorptance < 0.475
Internal walls	Plasterboard	
Party walls	Cavity Panel wider than 70mm	
Windows	Single glazed, clear	Holland Blinds to all glazing except to bathrooms
	Aluminium frame	Micos VLam Clear (U-value 6.5 & SHGC 0.52), modelled in BERS Pro as GJA-05-008a (U-value 6.54 & SHGC 0.54)
Roof	Concrete	Insulation: See Table 2
		Light colour: absorptance < 0.475
Ceilings	Plasterboard	Insulation: See Table 2
Floors	Concrete	Wet areas only: Tiles
		Elsewhere: Carpet

### 3.2 BERS PRO RESULTS (THERMAL COMFORT)

Energy summary reports for the modelled residential dwelling space are summarized in Table 2 below. The Additional Treatment listed in Table 2 below need to be implemented to the corresponding dwelling to achieve the heating and cooling loads required by BASIX.

Table 2: BERS Pro Energy Consumption Result

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Maximum BASIX Heating Load (MJ/m <sup>2</sup> .yr)	Maximum BASIX Cooling Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
601	701-1401	R1.5 External Wall Insulation	25.3	24.9	66.0	59.0	Pass
602	702-1402	R1.5 External Wall Insulation	13.8	23.1	66.0	59.0	Pass
603	703-1403	R1.5 External Wall Insulation	21.8	27.5	66.0	59.0	Pass
604	704-1404	R1.5 External Wall Insulation	14.5	28.2	66.0	59.0	Pass
605	705-1405	R1.5 External Wall Insulation	15.8	25.4	66.0	59.0	Pass
606	706-1406	R1.5 External Wall Insulation	34.9	30.0	66.0	59.0	Pass
607	707-1407	R1.5 External Wall Insulation	26.3	17.1	66.0	59.0	Pass
608	708-1408, 1506-2506	R1.5 External Wall Insulation	30.3	14.4	66.0	59.0	Pass
609	709-1409, 1507-2507	R1.5 External Wall Insulation	19.4	24.8	66.0	59.0	Pass
610	710-1410, 1508-2508	R1.5 External Wall Insulation	18.1	13.4	66.0	59.0	Pass
1501	1601-2501	R1.5 External Wall Insulation	30.1	25.6	66.0	59.0	Pass
1502	1602-4102	R1.5 External Wall Insulation	19.9	31.0	66.0	59.0	Pass
1503	1603-2403	R1.5 External Wall Insulation	21.5	32.1	66.0	59.0	Pass
1504	1604, 2204-2404	R1.5 External Wall Insulation	22.3	21.8	66.0	59.0	Pass
1505	1605-2505	R1.5 External Wall Insulation	17.4	15.1	66.0	59.0	Pass
1704	1804-2004	R1.5 External Wall Insulation	30.3	23	66.0	59.0	Pass
2104		R1.5 External Wall Insulation	33.9	40.3	66.0	59.0	Pass
2601	2701-4101	R1.5 External Wall Insulation	32.4	27.1	66.0	59.0	Pass

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m <sup>2</sup> .yr)	Cooling Load (MJ/m <sup>2</sup> .yr)	Maximum BASIX Heating Load (MJ/m <sup>2</sup> .yr)	Maximum BASIX Cooling Load (MJ/m <sup>2</sup> .yr)	Pass/Fail
2603	2703-4103	R1.5 External Wall Insulation	28.6	34.2	66.0	59.0	Pass
2604	2704-4104	R1.5 External Wall Insulation	25.4	22.1	66.0	59.0	Pass
2605	2705-4205	R1.5 External Wall Insulation	21.9	20.3	66.0	59.0	Pass
2606	2706-4206	R1.5 External Wall Insulation	16.4	33.9	66.0	59.0	Pass
2607	2707-4107	R1.5 External Wall Insulation	35.2	31.5	66.0	59.0	Pass
4201		R1.5 External Wall Insulation, R2.5 Ceiling Insulation	40.7	25.6	66.0	59.0	Pass
4202		R1.5 External Wall Insulation, R2.5 Ceiling Insulation	32.1	32.1	66.0	59.0	Pass
4203		R1.5 External Wall Insulation, R2.5 Ceiling Insulation	41.1	36.0	66.0	59.0	Pass
4204		R1.5 External Wall Insulation, R2.5 Ceiling Insulation	42.7	22.5	66.0	59.0	Pass
4207		R1.5 External Wall Insulation, R2.5 Ceiling Insulation	43.6	33.2	66.0	59.0	Pass

Table 3: Area Schedule

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
601	701-1401	None	101.6	0.0	93.4	38.2	0.0
602	702-1402	None	59.9	0.0	92.0	15.8	0.0
603	703-1403	None	95.2	0.0	111.9	25.4	0.0
604	704-1404	None	61.4	0.0	77.8	18.9	0.0
605	705-1405	None	57.7	0.0	65.8	25.2	0.0
606	706-1406	None	54.2	0.0	82.3	19.5	0.0
607	707-1407	None	59.9	0.0	82.4	20.1	0.0
608	708-1408, 1506-2506	None	104.7	0.0	126.8	30.9	0.0
609	709-1409, 1507-2507	None	104.2	0.0	130.1	24.6	0.0
610	710-1410, 1508-2508	None	135.1	0.0	104.8	50.8	0.0
1501	1601-2501	None	130.0	0.0	85.6	56.5	0.0
1502	1602-4102	None	64.2	0.0	79.3	21.6	0.0
1503	1603-2403	None	89.1	0.0	86.9	32.4	0.0

Unit No.	Repeated Units	Subfloor	Conditioned Area (m <sup>2</sup> )	Unconditioned Area (m <sup>2</sup> )	Wall Area (m <sup>2</sup> )	Window Area (m <sup>2</sup> )	Skylight (m <sup>2</sup> )
1504	1604, 2204-2404	None	96.1	0.0	111.8	28.8	0.0
1505	1605-2505	None	96.8	0.0	99.4	28.7	0.0
1704	1804-2004	None	101.4	0.0	110.5	36.6	0.0
2104		None	101.1	0.0	110.6	36.6	0.0
2601	2701-4101	None	133.9	0.0	89.5	60.4	0.0
2603	2703-4103	None	99.0	0.0	94.9	38.4	0.0
2604	2704-4104	None	96.6	0.0	123.1	25.8	0.0
2605	2705-4205	None	135.1	0.0	136.4	36.0	0.0
2606	2706-4206	None	145.6	0.0	123.0	49.8	0.0
2607	2707-4107	None	135.8	0.0	79.9	71.4	0.0
4201		None	93.9	0.0	93.9	55.9	0.0
4202		None	64.2	0.0	78.7	21.9	0.0
4203		None	99.0	0.0	94.4	38.7	0.0
4204		None	96.6	0.0	119.9	28.8	0.0
4207		None	135.0	0.0	79.0	71.4	0.0

#### 4. ENERGY

The proposed 7 Railway St, Chatswood development has met the mandatory BASIX energy target of 20%. For details of the requirements necessary to achieve this target, please refer to the BASIX Certificate Nos. 348978M, 348979M, 348980M and 348983M..

Below is the summary of the requirements:

- Alternative Energy Supply: 21.3kW Photovoltaic System
- Hot Water System (HWS):
  - Central Gas Boiler, with R1.0 (38mm) internal piping insulation for all apartments.
- Central Cooling System: Water Sourced Packaged Units, with Cooling Tower and low COP (less than 3.5).
- Central Heating System: Water Sourced Packaged Units, with heated water using Gas Boiler and medium COP (3.5 – 4.5).
- Lifts: 6 lifts, all using gearless traction with VVVF motor.
- Pool heating is using Gas with timer controlled pump installed.
- Sauna is using Electric Resistance with manual on/timer off switch.
- Common Area Ventilations:
  - Indoor Pool & Gym: air conditioned with time clock/BMS.
  - Carpark: ventilation supply + exhaust with CO monitor + VSD fan.
  - Lift motor, switch, garbage and plant rooms: ventilation exhaust only.
  - Ground Floor Lobbies: Air-conditioning with time clock/BMS.
  - Other Lobbies & Hallways: ventilation supply only with time clock/BMS.

- Common Area lightings:
  - Indoor Pool, Gym, Lift motor, switch, garbage and plant rooms: Compact fluorescent with manual on/off switch.
  - Car park: Fluorescent with zoned switching + motion sensors.
  - Lifts: Compact fluorescent.
  - Lobbies & Hallways: Compact fluorescent with time clock & motion sensors.
- Apartments Ventilation:
  - Kitchen Exhaust: individual fan, ducted to façade, with manual on/off switch.
  - Laundry & Bathroom Exhaust: motorised damper into central duct + VSD, with manual on/off switch.
- Heating & Cooling system to both living areas and bedrooms: Central Cooling + Heating, and must be Day/Night Zoned.
- At least 80% of light fittings in all apartments (including the main light fittings) in all bathrooms, laundries & bedrooms to use Fluorescent or LED lights with dedicated fittings<sup>3</sup>.
- All apartments must install:
  - Gas cooktop and electric oven.
  - Well-ventilated fridge space.
  - 3-star (Energy Rating) Dishwasher
  - 2.5-star (Energy Rating) Clothes Washer
  - 2-star (Energy Rating) Clothes Dryer.
  - Indoor<sup>4</sup> clothes drying line.

## 5. SUMMARY

The proposed development has been assessed in terms of its passive energy design (thermal comfort) using the Nationwide House Energy Rating scheme (NatHERS). The proposed development has also been assessed in terms of its ability to conserve water and also to minimise energy consumption via appliances and hot water etc. With the recommendations contained within this report we find that the proposed development is able to achieve a BASIX certificate. For further details, please refer to the BASIX Certificate Nos. 348978M, 348979M, 348980M and 348983M provided.

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

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<sup>3</sup> Definition of a 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.

<sup>4</sup> Examples of indoor or sheltered clothes drying lines include a screened line on balconies and an extendable line over a bath.

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

## 6. ARCHITECTURAL DRAWINGS

The environmental assessment carried out in this report was based on the following architectural drawings supplied by MIRVAC PROJECTS PTY LTD.

PA1000[1] DRAWING REGISTER  
PA1001[1] LOCALITY & CONTEXT PLAN  
PA1002[1] SITE PLAN  
PA1003[1] SITE ANALYSIS PLAN  
PA1004[1] B6 & B7 FLOOR PLANS  
PA1005[1] B5 & B4 FLOOR PLANS  
PA1006[1] B3 & B2 FLOOR PLANS  
PA1007[1] B1 FLOOR PLANS  
PA1008[1] LEVEL 1 (GROUND) FLOOR PLAN  
PA1009[1] LEVELS 2-4 & 5 FLOOR PLANS  
PA1010[1] LEVELS 6-13 FLOOR PLANS  
PA1011[1] LEVELS 14- 25 FLOOR PLANS  
PA1012[1] LEVELS 26-39 & 41 FLOOR PLANS  
PA1013[1] LEVELS 40 & 42 FLOOR PLANS  
PA1014[1] LEVELS 43, 43 MEZZANINE & ROOF PLAN  
PA1015[1] NORTH ELEVATION  
PA1016[1] SOUTH ELEVATION  
PA1017[1] EAST ELEVATION  
PA1018[1] WEST ELEVATION  
PA1019[1] SECTION A-A  
PA1020[1] SECTION B-B

This Report Has Been Prepared for

MIRVAC PROJECTS PTY LTD

By

VIPAC ENGINEERS & SCIENTISTS Ltd

