

Mirvac Projects Pty Ltd

7 Railway St, Chatswood

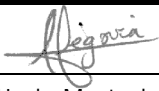
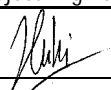
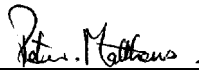
BASIX Assessment



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4th October 2011

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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 2nd 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_03, 348979M_03, 348980M_03 and 348983M_03.

Requirements:

- A total area of 1,000m² must be indigenous or low water use species.
- 70,000L rainwater tank collecting from 1175 m² of roof area. Water collected will be used for apartments toilet flushing for Levels 5 to 14 only.
- 70,000L stormwater tank collecting from 1800 m² of landscape area. Water collected will be used for Landscape Irrigation only.
- Pool size: 72kL.
- Common area facilities must install: 3-star (Water Rating)¹ showerheads, 3-star (Water Rating) toilets, 4-star (Water Rating) taps.
- All apartments except on Level 40-42 must install:
 - 3-star (Water Rating)² showerheads, 4-star (Water Rating) toilets, 4-star (Water rating) kitchen taps & 5-star (Water rating) bathrooms taps.
 - 3-star (Water rating) Clothes Washers.
 - 2-star (Water rating) Dishwashers.

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

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

- All apartments from Level 40-42 must install:
 - 3-star (Water Rating)³ showerheads, 4-star (Water Rating) toilets, 4-star (Water rating) kitchen taps & 5-star (Water rating) bathrooms taps.
 - 4-star (Water rating) Clothes Washers.
 - 3-star (Water rating) Dishwashers.

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

*Note: The developer is under no obligation to install Holland Blinds. These are used purely for simulation purposes under the BASIX Thermal Comfort Protocol

³ Greater than 7.5L/min but less than or equal to 9L/min

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 ² .yr)	Cooling Load (MJ/m ² .yr)	Maximum BASIX Heating Load (MJ/m ² .yr)	Maximum BASIX Cooling Load (MJ/m ² .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
605	705-1405	R1.5 External Wall Insulation	14.5	28.2	66.0	59.0	Pass
606	706-1406	R1.5 External Wall Insulation	15.8	25.4	66.0	59.0	Pass
607	707-1407	R1.5 External Wall Insulation	34.9	30.0	66.0	59.0	Pass
608	708-1408	R1.5 External Wall Insulation	26.3	17.1	66.0	59.0	Pass
609	709-1409, 1507-2507	R1.5 External Wall Insulation	30.3	14.4	66.0	59.0	Pass
610	710-1410, 1508-2508	R1.5 External Wall Insulation	19.4	24.8	66.0	59.0	Pass
611	711-1411, 1509-2509	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
1505	1605, 2205-2405	R1.5 External Wall Insulation	22.3	21.8	66.0	59.0	Pass
1506	1606-2506	R1.5 External Wall Insulation	17.4	15.1	66.0	59.0	Pass
1705	1805-2005	R1.5 External Wall Insulation	30.3	23	66.0	59.0	Pass
2105		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
2603	2703-4103	R1.5 External Wall Insulation	28.6	34.2	66.0	59.0	Pass

Unit No.	Repeated Units	Additional Treatments Required	Heating Load (MJ/m ² .yr)	Cooling Load (MJ/m ² .yr)	Maximum BASIX Heating Load (MJ/m ² .yr)	Maximum BASIX Cooling Load (MJ/m ² .yr)	Pass/Fail
2605	2705-4105	R1.5 External Wall Insulation	25.4	22.1	66.0	59.0	Pass
2606	2706-4206	R1.5 External Wall Insulation	21.9	20.3	66.0	59.0	Pass
2607	2707-4207	R1.5 External Wall Insulation	16.4	33.9	66.0	59.0	Pass
2608	2708-4108	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
4205		R1.5 External Wall Insulation, R2.5 Ceiling Insulation	42.7	22.5	66.0	59.0	Pass
4208		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 ²)	Unconditioned Area (m ²)	Wall Area (m ²)	Window Area (m ²)	Skylight (m ²)
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
605	705-1405	None	61.4	0.0	77.8	18.9	0.0
606	706-1406	None	57.7	0.0	65.8	25.2	0.0
607	707-1407	None	54.2	0.0	82.3	19.5	0.0
608	708-1408	None	59.9	0.0	82.4	20.1	0.0
609	709-1409, 1507-2507	None	104.7	0.0	126.8	30.9	0.0
610	710-1410, 1508-2508	None	104.2	0.0	130.1	24.6	0.0
611	711-1411, 1509-2509	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
1505	1605, 2205-2405	None	96.1	0.0	111.8	28.8	0.0
1506	1606-2506	None	96.8	0.0	99.4	28.7	0.0
1705	1805-2005	None	101.4	0.0	110.5	36.6	0.0
2105		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

Unit No.	Repeated Units	Subfloor	Conditioned Area (m ²)	Unconditioned Area (m ²)	Wall Area (m ²)	Window Area (m ²)	Skylight (m ²)
2603	2703-4103	None	99.0	0.0	94.9	38.4	0.0
2605	2705-4105	None	96.6	0.0	123.1	25.8	0.0
2606	2706-4206	None	135.1	0.0	136.4	36.0	0.0
2607	2707-4207	None	145.6	0.0	123.0	49.8	0.0
2608	2708-4108	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
4205		None	96.6	0.0	119.9	28.8	0.0
4208		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_03, 348979M_03, 348980M_03 and 348983M_03.

Below is the summary of the requirements:

- Alternative Energy Supply: 13.2kW Photovoltaic System (adjusted value for regenerative drive from lifts, approved by BASIX)
- Active power factor correction
- Hot Water System (HWS):
 - Central Gas Boiler, with R1.0 (38mm) internal piping insulation
- Central Cooling System: Water Sourced Packaged Units, with Cooling Tower and medium COP (3.5 – 4.5).
- 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 Regenerative drive motors⁴.
- 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.
 - Carpark: Ventilation supply + exhaust with CO monitor + VSD fan.
 - Lift Motor & Switch Room: Air-conditioned thermostatically controlled.
 - Garbage and plant rooms: Ventilation exhaust only.
 - Ground Floor Lobbies: Air-conditioning with time clock.
 - Other Lobbies & Hallways: Ventilation supply only with time clock.
- Common Area lightings:

⁴ Approved by BASIX team via Alternative Assessment

- Indoor Pool, Gym, Lift motor, switch and plant rooms: Compact fluorescent with manual on/off switch.
- Garbage rooms: Compact fluorescent with motion sensors.
- Car park: Fluorescent with zoned switching + motion sensors.
- Lifts: LED lighting.
- 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/timer 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 in all bathrooms, laundries & bedrooms to use Fluorescent or LED lights with dedicated fittings⁵.
- All apartments must install:
 - Gas cooktop and electric oven.
 - Well-ventilated fridge space.
 - 3-star (Energy Rating) Dishwasher
 - 3.5-star (Energy Rating) Clothes Washer
 - 2-star (Energy Rating) Clothes Dryer.
 - Indoor or sheltered clothes drying line (e.g.: screened line on balcony, line over bath, etc)

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.

⁵ 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.

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

