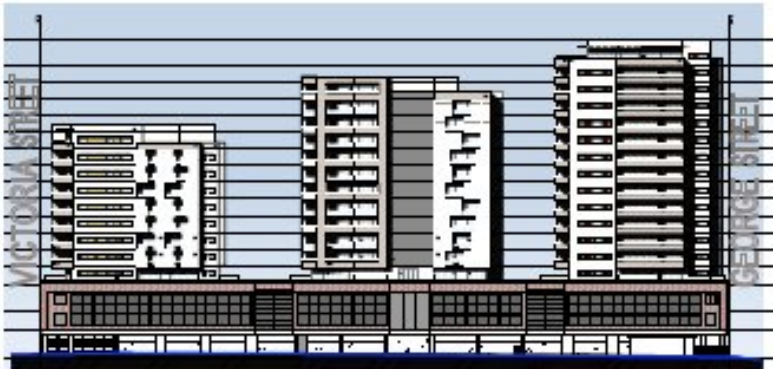
Kavlyn Pty Ltd

Elsie, George and Victoria Streets, Burwood

BASIX Assessment



Report No. 20C-06-0038-TRP-247481-5

Vipac Engineers & Scientists Ltd

Sydney, NSW

9th December 2008

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BASIX Assessment

REPORT NO:
20C-06-0038-TRP-247481-5

LIBRARY CODE:
A 65

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REVISION HISTORY:

Revision No.	Date Issued	Reason/Comments
0	18 October 2007	Initial Issue
1	4th August 2008	Update BASIX Assessment
2	6th August 2008	Certificate No. Included
3	1st December 2008	Building B, levels 4-7 & 12-14 updated
4	9th December 2008	BASIX updated
5	9th December 2008	BASIX certified

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KEYWORDS: Elsie, George and Victoria Streets, Burwood, BASIX

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EXECUTIVE SUMMARY

VIPAC Engineers & Scientists Ltd. has been commissioned by Turner & Associates to assess the interaction of the proposed developments with the local environment in terms of BASIX compliance.

The site is located on a block bounded by existing developments adjoining the site. George Street runs on the southern of the site. The proposed development will comprise of 3 buildings (Block A, B & C) above a podium which contains ground level + 2 levels of retail and commercial spaces. Block A contains 14 levels of residential apartments, Block B contains 12 levels of residential apartments, Block C contains 9 levels of residential apartments.

Apartments within the development will be of single storey units. The apartments will be a mix 1, 2 and 3 bedrooms. Each apartment will include balcony/terrace space.

Residential units 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 (achieving Water target of 40% and Energy target of 20%). For further details, please refer to the BASIX Certificate provided for this DA submission.

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 with respect to 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. From 1st July 2006, BASIX has set targets so that each new residential development will use 40% less drinking-quality water and produce less greenhouse gas emissions than average NSW homes of the same type (target varies over Zones and building types, please refer to: http://www.basix.nsw.gov.au/information/common/pdf/alts_adds_req/energy_fact_sheet.pdf).

NatHERS is Australian designed software used for assessing the thermal performance of residential units and houses in New South Wales and can be used to assess the thermal comfort of dwellings under the BASIX scheme if the deemed to comply method is not suitable. NatHERS 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. Heating and cooling loads for the development have been determined using NatHERS software.

2. WATER

The proposed development has achieved the BASIX Water target of 40%. For details of the requirements necessary to achieve the 40% target, please refer to the BASIX Certificate No. 227038M for Building A, BASIX Certificate No. 227061M for Building B, and BASIX Certificate No. 227122M for Building C provided for this DA submission.

Overall requirements:

- Landscaping size: 383m^2 lawn and 660m^2 garden (500m^2 of the garden must be indigenous/low water use).
- A 10,000 Litre Rainwater tank, collecting from all roof area.
- Irrigation of all landscaping areas and 2 car wash bay uses water from Rainwater tank.
- 3 star (Water Rating) toilets and taps to all non-residential (common areas) bathrooms.
- 3 star (Water Rating) showerheads, 4 star (Water Rating) toilets and 6 star (Water Rating) kitchens and bathrooms taps to all apartments.
- 5-star (Water Rating) Dishwashers must be installed in all apartments.
- 4-star (Water Rating) Washing machine must be installed in each of the following apartments: A1501 – A1506, A1601 – A1604, B1301 – B1303, B1401 – B1403, and C1101 – C1104.

3. THERMAL COMFORT

3.1. NATHERS MODELLING ASSUMPTIONS

NatHERS 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 - Base Case (NATHERS Model)

Element	**Material**	**Detail**
External walls	Cavity Brick	
	Insulation	None
	Medium colour	0.475 – 0.7 absorptance
Internal walls	Plasterboard	
Windows	Single glazed clear	with Holland Blinds (NatHERS default)
	Aluminium frame	
Roof	Concrete	Medium colour (0.475 – 0.7 absorptance)
Ceilings	Plasterboard	
Floors	Concrete slab	130 mm concrete
	Carpet and tiles covering	15mm total thickness (carpet + underlay)

3.2. NATHERS RESULTS (THERMAL COMFORT)

Energy summary reports for each modelled residential apartment space are summarized in Table 2 below. The residential units chosen for analysis were considered to encompass the diversity of unit design within the whole development in terms of energy efficiency. The Additional Treatment listed in Table 2 below need to be implemented to the corresponding unit to achieve the heating and cooling loads required by BASIX.

Table 2: NatHERS Energy Consumption Results and Additional Treatments

Unit	Represented Units	Heating Load (MJ/m^2)	Cooling Load (MJ/m^2)	Heating Load Caps (MJ/m^2)	Cooling Load Caps (MJ/m^2)	Pass/Fail	Additional Treatment
A301	A401 - A1401	73.5	49.7	**132.4**	**68.2**	**Pass**	None
A303		38.3	41.2	**136.3**	**70.2**	**Pass**	None
A304	A404 - A1404	39.8	7.4	**139.8**	**72.0**	**Pass**	None
A305	A405 - A1405	68.0	19.0	**132.0**	**68.0**	**Pass**	None
A306	A406 - A1406	65.0	9.0	**132.8**	**68.4**	**Pass**	None
A307	A407 - A1507	118.7	13.6	**131.5**	**67.7**	**Pass**	None
A402	A502 - A1402	73.4	17.6	**139.5**	**71.9**	**Pass**	None
A403	A503 - A1403	33.7	27.9	**134.0**	**69.0**	**Pass**	None
A1501		79.2	55.4	**132.4**	**68.2**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
A1502		86.6	21.6	**139.5**	**71.9**	**Pass**	None
A1503		49.3	40.9	**134.0**	**69.0**	**Pass**	None
A1504		37.0	13.1	**139.8**	**72.0**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
A1505		66.4	32.7	**132.0**	**68.0**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
A1506		71.9	11.2	**132.8**	**68.4**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
A1601		132.1	58.7	**134.6**	**69.3**	**Pass**	R1.5 Roof Insulation to exposed areas
A1602		113.8	61.7	**131.9**	**68.0**	**Pass**	R1.5 Roof Insulation to exposed areas

Unit	Represented Units	Heating Load (MJ/m^2)	Cooling Load (MJ/m^2)	Heating Load Caps (MJ/m^2)	Cooling Load Caps (MJ/m^2)	Pass/Fail	Additional Treatment
A1603		116.8	41.8	**129.4**	**66.7**	**Pass**	R1.5 Roof Insulation to exposed areas
A1604		130.6	31.8	**131.5**	**67.7**	**Pass**	R1.5 Roof Insulation to exposed areas
B301	B401 - B901	83.5	31.4	**138.0**	**71.1**	**Pass**	None
B302		36.1	25.7	**132.6**	**68.3**	**Pass**	None
B303	B403 – B1003, B1102 – B1302	85.3	26.6	**132.7**	**68.4**	**Pass**	None
B304	B404 – B1004	67.3	9.6	**135.0**	**69.6**	**Pass**	None
B305	B405 - B905	94.9	21.5	**138.3**	**71.3**	**Pass**	None
B402	B502 – B1002, B1101 – B1301	42.6	31.0	**131.5**	**67.7**	**Pass**	None
B1001		117.6	59.9	**138.0**	**71.1**	**Pass**	R1.0 Roof Insulation to exposed areas
B1005		124.7	41.5	**138.3**	**71.3**	**Pass**	R1.0 Roof Insulation to exposed areas
B1103	1203, 1303	63.6	8.2	**134.2**	**69.1**	**Pass**	None
B1401		72.5	61.0	**131.4**	**67.7**	**Pass**	R1.0 Roof Insulation to exposed areas
B1402		111.6	50.7	**132.7**	**68.4**	**Pass**	R1.0 Roof Insulation to exposed areas
B1403		97.1	25.1	**134.2**	**69.1**	**Pass**	R1.0 Roof Insulation to exposed areas
C301		90.3	43.8	**132.2**	**68.1**	**Pass**	None
C302	C403 - C903, C1002	69.2	17.2	**134.6**	**69.4**	**Pass**	None
C303	C404 - C904, C1003	50.8	11.9	**134.6**	**69.4**	**Pass**	None
C304	C405 - C905, C1004	86.9	35.2	**133.6**	**68.8**	**Pass**	None
C305	C406 - C906	106.5	11.9	**132.3**	**68.2**	**Pass**	None
C401	C501 - C901	133.0	60.0	**141.0**	**72.7**	**Pass**	R1.0 External Wall Insulation
C402	C502 - C902	55.6	12.0	**140.9**	**72.6**	**Pass**	None

Unit	Represented Units	Heating Load (MJ/m^2)	Cooling Load (MJ/m^2)	Heating Load Caps (MJ/m^2)	Cooling Load Caps (MJ/m^2)	Pass/Fail	Additional Treatment
C407	C507 - C907	92.0	5.9	**136.0**	**70.0**	**Pass**	None
C1001		102.1	55.1	**132.2**	**68.1**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
C1005		115.6	17.7	**132.3**	**68.2**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
C1006		110.6	12.3	**136.0**	**70.0**	**Pass**	R1.0 Roof/Ceiling Insulation to exposed areas
C1101		89.5	36.2	**134.6**	**69.4**	**Pass**	R1.5 Roof Insulation to exposed areas
C1102		72.3	22.8	**134.6**	**69.4**	**Pass**	R1.5 Roof Insulation to exposed areas
C1103		106.2	52.7	**133.6**	**68.8**	**Pass**	R1.5 Roof Insulation to exposed areas
C1104		112.6	31.4	**132.1**	**68.1**	**Pass**	R1.0 External Wall Insulation, R1.5 Roof Insulation to exposed areas

Table 3: Area Schedule

Unit	Represented Units	Sub-floor	Conditioned Area (m^2)	Unconditioned Area (m^2)	Wall (m^2)	Window (m^2)	Skylight (m^2)
A301	A401 - A1401	None	104.9	0.0	36.0	26.0	0.0
A303		None	76.3	0.0	27.9	21.3	0.0
A304	A404 - A1404	None	57.7	0.0	6.4	12.5	0.0
A305	A405 - A1405	None	108.4	0.0	26.7	33.0	0.0
A306	A406 - A1406	None	101.3	0.0	2.5	21.3	0.0
A307	A407 - A1507	None	113.7	0.0	49.3	29.0	0.0
A402	A502 - A1402	None	59.2	0.0	11.7	14.0	0.0
A403	A503 - A1403	None	92.1	0.0	31.9	21.3	0.0
A1501		None	104.9	0.0	36.0	26.0	0.0
A1502		None	59.2	0.0	11.7	14.0	0.0
A1503		None	92.1	0.0	31.9	21.3	0.0
A1504		None	57.7	0.0	6.4	12.5	0.0
A1505		None	108.4	0.0	26.7	33.0	0.0
A1506		None	101.3	0.0	2.5	21.3	0.0
A1601		None	87.5	0.0	28.2	28.3	0.0

Unit	Represented Units	Sub-floor	Conditioned Area (m^2)	Unconditioned Area (m^2)	Wall (m^2)	Window (m^2)	Skylight (m^2)
A1602		None	109.2	0.0	20.5	47.0	0.0
A1603		None	136.7	0.0	21.9	50.8	0.0
A1604		None	113.7	0.0	49.3	29.0	0.0
B301	B401 - B901	None	66.5	0.0	25.2	17.2	0.0
B302		None	102.9	0.0	28.2	31.3	0.0
B303	B403 – B1003, B1102 – B1302	None	102.0	0.0	23.9	38.8	0.0
B304	B404 – B1004	None	84.6	0.0	16.6	14.5	0.0
B305	B405 - B905	None	65.0	0.0	25.4	17.4	0.0
B402	B502 – B1002, B1101 – B1301	None	113.4	0.0	34.5	35.8	0.0
B1001		None	66.5	0.0	25.2	17.2	0.0
B1005		None	65.0	0.0	25.4	17.2	0.0
B1103	1203, 1303	None	90.7	0.0	16.6	14.5	0.0
B1401		None	113.4	0.0	34.5	35.8	0.0
B1402		None	102.0	0.0	23.9	38.8	0.0
B1403		None	90.7	0.0	16.6	14.5	0.0
C301		None	106.9	0.0	39.8	31.8	0.0
C302	C403 - C903, C1002	None	87.2	0.0	28.2	24.5	0.0
C303	C404 - C904, C1003	None	87.2	0.0	9.1	22.0	0.0
C304	C405 - C905, C1004	None	95.1	0.0	18.1	40.0	0.0
C305	C406 - C906	None	105.8	0.0	27.9	27.5	0.0
C401	C501 - C901	None	52.4	0.0	21.2	28.8	0.0
C402	C502 - C902	None	53.1	0.0	12.7	10.3	0.0
C407	C507 - C907	None	78.4	0.0	13.5	16.3	0.0
C1001		None	106.9	0.0	39.8	31.8	0.0
C1005		None	105.8	0.0	27.9	27.5	0.0
C1006		None	78.4	0.0	13.5	16.3	0.0
C1101		None	87.2	0.0	28.2	24.5	0.0
C1102		None	87.2	0.0	9.1	22.0	0.0
C1103		None	95.1	0.0	18.1	40.0	0.0
C1104		None	107.5	0.0	49.3	29.0	0.0

4. ENERGY

The proposed development has achieved the BASIX Energy target of 20%. For details of the requirements necessary to achieve the 20% target, please refer to the BASIX Certificate No. 227038M for Building A, BASIX Certificate No. 227061M for Building B, and BASIX Certificate No. 227122M for Building C provided for this DA submission.

Overall requirements:

- Central Hot Water system: Gas Fired Storage (manifolded), with R0.6 (25mm) internal piping insulations.
- Lifts to use Gearless Traction with VVVF motor.
- Common Areas ventilations:
  - Carpark: ventilation (Exhaust & Supply) use CO Monitor + VSD fan.
  - Plant room at Ground level ventilation (exhaust only) is continuous.
  - Plant rooms at roof levels are naturally ventilated.
  - Garbage room ventilation (exhaust only).
  - Ground floor lobbies, other levels' hallways and lobbies, and other internal common areas use no mechanical ventilation.
- Common Area lighting:
  - Carpark uses Fluorescent lights with time clock;
  - Lift uses Fluorescent lights;
  - Garbage rooms and Plant rooms use Compact Fluorescent lights with manual on/off switch.
  - Lobbies and Hallways use Compact Fluorescent lights with time clock.
- All apartments use Central Hot Water System.
- Ventilation for apartments:
  - Bathrooms use individual fan, ducted to façade/roof, with manual on/off switch.
  - Kitchens & Laundries use individual fan, ducted to façade/roof, with manual on/off switch.
- All apartments install 1-phase Air-conditioning (3.5 Star) for cooling only.
- All apartments: no commitment on the use of Fluorescent or LED lights with dedicated fittings in all apartments.
- All apartments must install:
  - Gas cooktop and electric oven;
  - Well ventilated fridge space;

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 (achieving Water target of 40% and Energy target of 21%). For further details, please refer to the BASIX Certificate No. 227038M for Building A, BASIX Certificate No. 227061M for Building B, and BASIX Certificate No. 227122M for Building C provided for this DA submission.

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.

ARCHITECTURAL DRAWINGS

The environmental assessment carried out in this Report was based on the following architectural drawings prepared by Turner + Associates Architects.

DA DRAWINGS						
Cover						
Site/roof Plan	1:500 @ A1	DA10	G	H	I	I
Level 3	1:200 @ A1	DA11	G	I	I	I
Level 4-7	1:200 @ A1	DA12	G	I	I	I
Level 8	1:200 @ A1	DA13	G	H	H	H
Level 9-10	1:200 @ A1	DA14	F	G	G	G
Level 11	1:200 @ A1	DA15	G	I	I	I
Level 12	1:200 @ A1	DA16	F	G	G	G
Level 13-14	1:200 @ A1	DA17	G	H	H	H
Level 15-16	1:200 @ A1	DA18	F	H	H	H
Level 17	1:200 @ A1	DA19	G	H	H	H
Tower C north & south elevations	1:200 @ A1	DA20	E	F	F	F
East elevations	1:200 @ A1	DA21	E	G	G	G
Tower A north & south elevations	1:200 @ A1	DA22	E	F	F	F
West elevations	1:200 @ A1	DA23	E	F	F	F
Tower B north & south elevations	1:200 @ A1	DA24	E	F	F	F
Section AA	1:200 @ A1	DA30	A	B	B	B
Section BB Tower A	1:200 @ A1	DA31	A	B	B	B
Section CC Tower B	1:200 @ A1	DA32	A	B	B	B
Section DD Tower C	1:200 @ A1	DA33	A	B	B	B

This Report Has Been Prepared

For

Kavlyn Pty Ltd

by

VIPAC ENGINEERS & SCIENTISTS Ltd