

ESD Report

Blue Sky Private Real Estate

44 Brookes Street

Bowen Hills



ECO LATERAL

Document Details

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Ref: 5303/1 44 Brookes Street ESD Report

INTRODUCTION

BlueSky Private Real Estate (BSPRE) intends to develop a twelve storey multi-unit residential tower at 44 Brookes Street on the corner of Mallon Street and Brookes Street, Bowen Hills. The land is presently occupied by a two storey commercial building which will be removed. The land is within the Bowen Hills PDA and as a result has specific requirements for development. BSPRE wish to deviate slightly from the provisions of the planning scheme by marginally increasing the gross floor area. This additional space will make the project viable and will arguably make better use of the land. BSRE and their architect have had discussions with EDQ to determine if this marginal deviation would be considered appropriate and under what circumstances. The Bowen Hills PDA can accommodate options outside of the planned baselines through Superior Design Outcomes (SDO's), provided there is a credible and realisable benefit to the community. Affordability, accessibility and sustainability must be addressed and it needs to be demonstrated that a proposed design solution goes above and beyond standard practice.

Establishment of a close working relationship with tertiary institutions and private industry to identify projects demonstrating superior design outcomes to be instituted in the UDA.

Bowen Hills Urban Development Area Development Scheme
Effective 2 July 2008

To increase the overall benefit it was suggested that a high level of sustainability should be included to work in conjunction with the other two deliverables. BSRE engaged Ecolateral Pty Ltd, a sustainability consultancy, to work with the architects to provide a high level of sustainability consistent with the Superior Design Outcomes. This report is the culmination of that work and sets down the initiatives proposed to be undertaken on this development.

INITIATIVES

Superior Design Outcomes are intended to deliver a combined benefit to the environment, the wider community and the building residents. Additionally they must be considered in the context of their affordability and accessibility. The inclusion of SDO's must have a positive benefit across the three areas of consideration and must deliver practical and appropriate benefits.

In considering the proposed initiatives Ecolateral has categorised the SDO's in a tabular form under the area most likely to benefit from the particular initiative. In many cases there may be combined effects which offer added benefits through the adoption of a balanced and synchronised approach. Therefore the removal or replacement of any or all of these initiatives with alternate solutions should be considered carefully as some of the additional benefits may not be realised.

The delivery of a building with these inclusions should see the expected 50 year life of the building realised and the return on investment maximised. These considerations have informed the general approach to the proposed initiatives below.

No.	Location	SDO Initiative	Action	Impact
Community/Resident Benefit				
1	Level 3	Planting on terraces	Provide one patented colorbond vegetable box to each unit to encourage the growth of vegetables 	Activated and shaded podium levels with strong indoor outdoor connectivity. Encourages the occupants to use external environment as an alternative to running AC plant.
2	General	Light pollution	Lighting on the outside of the building should be positioned so it does not spill onto the adjoining buildings except to the extent set down in AS4282	Minimise light pollution from the development
3	Bicycle Allowance	Provide bicycle parking for tenants and visitor	Each car space will have a bicycle rack on the wall to accommodate safe parking of tenant's bicycles. Dedicated visitor parking area is provided on the northern side of the building with bike racks x 4 	Increase the use of healthier mode of transport and to reduce dependence on fossil fuel based transport
Environmental Benefit				
4	Reticulated Gas	Hot water system/cooking	Centralised gas hot water system and reticulated gas cook tops and ovens	Lower carbon footprint and increased space in the units
5	General	Waste management	Each unit will be supplied with a dual bin system in the kitchen for separation of waste at source	Easier waste management to ensure appropriate use of chutes
6	General	Dual chutes	Each floor will be serviced by a dual chute for general waste and recyclable waste	Reduced land fill and maximised recycling of discarded materials
7	All units	Air change and dilution	Provide min 1200 mm sweep ceiling fan to bedrooms and to the living room.	Physiological cooling from air movement. Increased impact of air condition when run in conjunction with the fan
8	All units	Increase natural light penetration into units	Provide light coloured floors walls and ceilings to increase light penetration into the homes	Lower energy use by artificial light. Increased amenity and positive ambience in the unit
9	General	Energy reduction	Provide a kill switch to each unit at main point of exit that turns off all lights, air	Energy efficiency and lower fire risk

No.	Location	SDO Initiative	Action	Impact
			conditioning and heating.	
10	General	Water efficient fittings	All water fittings within the units meet the highest available WELS ratings 	Water conservation
11	General	Concrete	Concrete should have the following minimum fly ash content: - 30% in situ - 20% precast - 15% stressed	Lower use of Portland cement with associated lower carbon emissions
12	General	Steel	Steel should be sourced from an accredited responsible steel maker	Lowered energy use in manufacture
13	Recycling	Material and land fill savings	Maximise the reuse of demolition materials from the existing building. Where possible retain the demolition materials for reuse on site	Saving on materials and embodied energy
14	Common area lighting	Energy reduction	Provide LED lighting throughout common areas with sensors in lift lobbies activated with door lift door opening.	Save energy in common areas
Resident Benefit				
15	General	Air quality	Ensure all paints, furniture and carpets have low TVOC in accordance with appropriate standards	Cleaner, healthier and less toxic indoor air
16	General	Builders Users Guide (BUG)	Create a BUG for the units, which includes basic use information for each unit including an education pack on the most efficient appliances and their use	Clear understanding by tenants on how to use the building, combat energy costs and support a more effective and efficient culture. Can include general information as well as sustainability initiatives
17	Energy cost Reduction	Economix Indicator	Provide a personalised modelling of total energy forecast and education pack to each tenant	Stronger understanding of how energy can be saved in the units and associated lower energy costs.
18	General	Air quality	Ensure all internal cabinetry uses E0 board	Cleaner, healthier and less toxic inside air
19	Efficient lighting to units	Energy reduction	Provide 100% efficient lighting to units	Energy efficiency in units.
Community Benefit				
20	Units 1&4	LHA Silver Level Design Accredited	Units 1&4 will be Livable Housing Australia Silver Level Design Accredited.	Accessible for residents with disabilities http://livablehousingaustralia.org.au/
21	Water	Make provision	Provide 3kl water tank to	Opportunity to establish an edible

No.	Location	SDO Initiative	Action	Impact
	storage	for water harvesting	roof for irrigation of roof gardens	garden on the roof for general use
22	Roof Use	Food production	Provide 3x colorbond vegetable boxes 	Tenant herb or citrus growth for communal use
23	Clothes drying	Energy reduction	Provide a wall mounted 5 strand pull out line to each balcony in a convenient and no obtrusive location 	Avoid the provision and use of electric clothes dryers

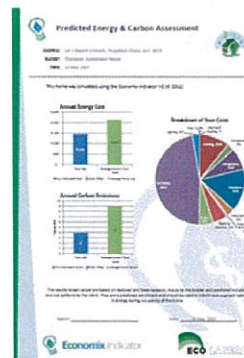
ENERGY OPTIMISATION



(See item 17 above)

With the heating and cooling load controlled by the building envelope, attention must be paid to the remaining 75% of the energy consumed by the average South East Queensland residence. This energy is a combination of lighting, water heating and the array of electrical appliances that most homes have these days. Getting control of this energy proves significantly more difficult as it is influenced by the occupant's choice of appliances and fittings and their use of those appliances and fittings once installed in the unit. The returns from efficiently using an inefficient appliance is limited when compared to the efficient use of an efficient appliance. Successive governments have introduced a myriad of rating schemes including Star Ratings, MEPS, Coefficient of performance measures, energy efficiency ratings etc. While these measures offer a wealth of information, most consumers find them confusing and in the absence of clarity, tend to make decisions based on appearance and price.

To provide a high level of appreciation of what to purchase and how to operate appliances and fittings, Ecolateral suggest each unit is provided with a pack for the occupants that delivers two essential services. Firstly, a Building Users Guide (BUG) that will provide basic information for the occupant on the environmental features of the complex and locality. Secondly, this BUG will form part of the operational procedure for the unit and will be coupled to a program called Economix Indicator (EI). The EI will model the unit based on the most appropriate appliances and use patterns and allow the occupants to appreciate that the unit can save significant amounts of energy and money if operated efficiently. The EI will include a User's Guide developed especially to cater for appliance and fittings used within the units. It is expected that a number of these units may be sold for corporate letting which, if they are efficient in operation, will make them significantly more attractive to investors. Set out below is a sample of some of the documents produced for the Economix Indicator.



Together, these initiatives can see the operational energy of the units and the building as a whole reduced significantly. Up to 50% may be achievable over time. These measures when coupled with the other initiatives such as good indoor air quality will result in a building that provides a significant return on investment both financial and environmental, for the occupants, owners and society.

STAR RATINGS OF UNITS

Under the QDC MP 4.1, class 2 buildings are required to achieve a 5 star average rating across the development, with no unit achieving less than 4 stars. As discussed above, air conditioning and heating loads generally represent about 25% of the total energy consumed by dwellings. So increasing the star rating beyond a certain point will result in diminishing returns for energy demand management. The quest to increase the building envelope's performance grows increasingly more expensive while the return in energy efficiency decreases. Ecolateral has modelled the most recent iteration of the drawing and has established a NatHERS 7.5 star average rating across all of the units. This represents a high performance level and any further star increases could be counterproductive from an affordability perspective. The following table sets out the preliminary results for the units. The higher the load the more energy will be required to retain the internal temperature in the comfort zone.

Unit	Run	Cooling Load (MJ/m ²)	Heating Load (MJ/m ²)	Total Load (MJ/m ²)	Star Rating
101	1	13.0	47.9	60.9	4.5
102	1	7.6	36.2	43.7	5.5
103	1	7.1	36.8	43.9	5.5
104	1	12.6	49.3	61.9	4.5
201	1	11.4	17.8	29.2	7.5
202	1	8.1	4.8	12.9	9.5
203	1	7.0	4.9	11.9	9.5
204	1	9.8	21.8	31.6	7.0
301	1	9.6	20.5	30.1	7.0
302	1	7.2	5.9	13.1	9.0
303	1	6.3	6.2	12.5	9.5
304	1	9.9	24.6	34.5	6.5
401	1	9.4	21	30.4	7.0
402	1	7.2	6.4	13.7	9.0
403	1	6.3	6.4	12.7	9.5
404	1	9.9	25.0	34.8	6.5
501	1	10.5	20.5	31.0	7.0
502	1	7.7	6.6	14.3	9.0
503	1	6.8	7.0	13.8	9.0
504	1	10.7	25.3	36.0	6.5
601	1	10.6	20.7	31.2	7.0
602	1	7.7	7.0	14.7	9.0
603	1	6.8	7.1	13.9	9.0
604	1	10.7	25.5	36.1	6.5
701	1	10.6	21.0	31.5	7.0
702	1	7.6	6.9	14.4	9.0
703	1	6.9	7.3	14.1	9.0

Unit	Run	Cooling Load (MJ/m ²)	Heating Load (MJ/m ²)	Total Load (MJ/m ²)	Star Rating
704	1	10.6	25.7	36.3	6.5
801	1	10.4	21.1	31.6	7.0
802	1	7.6	7.3	15.0	9.0
803	1	6.9	7.4	14.3	9.0
804	1	10.4	25.9	36.4	6.5
901	1	10.5	21.3	31.8	7.0
902	1	7.9	7.1	14.9	9.0
903	1	7.0	7.5	14.5	9.0
904	1	10.2	26.1	36.3	6.5
1001	1	12.1	39.1	51.1	5.0
1002	1	10.1	26.2	36.3	6.5
1003	1	9.8	27.7	37.5	6.5
1004	1	10.3	42.4	52.7	5.0
AVERAGE		9.1	19.4	28.4	7.5

Note: Heating and cooling loads are automatically adjusted to take into consideration unit floor area.

The comparative heating and cooling load savings at 44 Brookes Street and a business as usual (BAU) case is presented in the following table.

Average unit floor area	62.75 sq m
Average mandatory energy performance for units under QDC requirements (BAU)	55 MJ/sq m/a
Averaged achieved energy performance at 44 Brookes St /unit	28.4 MJ/sq m/a
Brookes St savings in kWh/unit/annum over BAU	464 kWh
Savings in Energy Costs/ unit/annum @ 29c per kWh	\$ 134.50
Overall building H&C Energy Savings/annum over BAU scenario	18,560 kWh. (18.6MWh)/annum 15.3 tonnes of Carbon / annum

CONCLUSION

If the above SDO's are adopted, the units at 44 Brookes Street will provide a significantly higher level of environmental performance, community benefit and resident assets than a business as usual case. The units will have resilience against energy price increases, will be healthier to live in, decrease the peak load demand and should increase the asset value quicker over time.