

## ENVIRONMENT DESIGN GUIDE

## GEORGE STREET APARTMENTS, FITZROY

Steve Mathews

## 1.0 PROJECT OUTLINE

## 1.1 Project details

**Client**

Gore Street Properties Pty Ltd

**Consultants****Architect**

Gregory Burgess Architects

**Builder and project management**

Corsair Constructions Pty Ltd

**Sustainability consultant**

Alan Pears, Sustainable Solutions

**Structural engineer**

Peter Yttrup and Associates

**Landscape architect**

Taylor Cullity Lethlean Pty Ltd

**Services engineer**

Connell Mott McDonald

**Year of completion**

2003

**Project type**

Multi-unit residential development

**Activity undertaken**

Design and construction of eleven residential apartments for owner-occupiers and investors, from 77 square metres to 154 square metres

**Floor area**

1368 square metres excluding basement, with a footprint of 500 square metres and a site coverage of 65 per cent.

**Number of storeys**

Three plus basement car parking and storage

**Cost at completion**

\$3.5 million

**Cost of apartments**

Ranging from \$335,000 for a 77 square metre one-bedroom apartment to \$560,000 for a 154 square metre-three bedroom apartment

**Occupancy rates**

Fully sold (nine off the plan, two on completion), with 100 per cent occupancy rate. Sales were reasonably brisk to start with, but the last two were more difficult – due to the downturn in the inner city apartment market by the time of completion, and a configuration of one unit that some potential purchasers found unusual.

**Location**

The project is located in George Street Fitzroy, between Gertrude Street and Victoria Parade, approximately one kilometre from Melbourne's CBD. It is close to shops, services, educational facilities, parks and sporting venues, and is well serviced by public transport. Over the last 20 years the area has undergone considerable gentrification. The street contains a large number of relatively intact Victorian terrace houses, as well as some unsympathetic apartment developments from the 1960's and 70's.

The development falls within the City of Yarra and is subject to its planning scheme. At the time of planning (May 2000) the City of Yarra's Urban Character Strategy identified this area as 'notable for the consistency of its Victorian streetscapes'. Yarra council had in place its own pre-Rescode 'Development Guidelines for Heritage Places', which set out requirements for infill development in heritage areas. It stated a commitment to 'preserving the historic character and at the same time encouraging good contemporary design that is reflective of our times'.

**Background to project**

The 811 square metre site had been owned by the Mathews family since the early 1970's, and was used as a car park by nearby businesses up until construction commenced in 2002. In 1998 several family members (including this author) formed a company, Gore Street Properties Pty Ltd, with a view to developing the site. The members of the company had a strong interest in environmental and social issues, and were keen to apply these principles to the project.

The site's location, in an area with some high heritage values falling under the Yarra council's 'Development Guidelines for Heritage Places', required that the appearance of the building be respectful of this heritage context, without reproducing the architecture of the past.

## 2.0 DESIGN PHILOSOPHY

## 2.1 Design intention and sustainability objectives

Given our interest in environment, design and social issues, we as developers, wanted a building with a high level of environmental performance and aesthetic appeal, which also provided for a range of household sizes and budgets. Although focussing on energy and water efficiency, we also wanted to explore other ecologically sustainable development ((ESD) opportunities, such as the sustainable use of materials, wherever possible.

Energy and water were focused on because they were seen as areas where significant gains could be achieved,



**Figure 1. Facade of George Street apartments**

and because their high public profile lent them to a green marketing campaign. We wanted all apartments to achieve a minimum five star energy efficiency rating under the Sustainable Energy Authority of Victoria's (SEAV) 'FirstRate' assessment tool. When the building was designed in the late 1990's there was no regulatory requirement for buildings to conform to any energy efficiency standards.

Water efficiency objectives were phrased in relative terms, with the objective to reduce water consumption compared to the average usage of an apartment of similar size. We did not start out with a target figure, instead taking the approach of applying whatever techniques would yield the greatest efficiencies within our budget. We thereby avoided the possibility of setting a low figure, and giving up the opportunity of further gains once this had been achieved. We felt that this was appropriate given the somewhat experimental nature of our project.

With materials, we focussed on managing wastes during the construction process, and wherever possible selected materials with low environmental impact relative to standard choices. This was more difficult, given that detailed information was not always available on the embodied energy and environmental impacts of the specific building products we were interested in.

In a more strategic sense, we were also committed to urban consolidation as a means of achieving ESD. Our apartment proposal allowed us to locate eleven households close to shops, services, facilities and public transport, rather than the three households of the standard terrace house model. We also felt this helped address an important social dimension of sustainability – providing opportunities for a mix of household types, from singles (small one bedders) to families (larger, three bedroom apartments), as well as including

the potential for some apartments to incorporate home offices. At the same time the apartment option increased the affordability of our product – the price at which terraces would have had to be sold came in at over \$1 million each, well beyond the reach of most home buyers – particularly younger people and the elderly.

## 2.2 Planning, design and consultation process

A series of design meetings were held during the early stages, involving the developer, architect, builder and ESD consultant. This allowed many issues of sustainability, cost, buildability, aesthetics, functionality and marketability to be discussed with everyone present, and solutions to the sometimes conflicting demands of the project to be hammered out. While we did not include sub-contractors in these meetings, we later felt it would have been helpful if engineers etc had been involved early in order to increase their commitment to finding sustainable solutions. We also met with our real estate agent at an early stage, to ensure that what we came up with was going to be marketable.

The key to this process was the input of our sustainability consultant Alan Pears, as was working with an architect with a strong track record in green buildings, and a builder with a commitment to exploring all aspects of environmental construction. Alan is a leader in the field of sustainability and had worked on the Australian Conservation Foundation's 60L Green Building in Carlton. Greg Burgess is widely recognised by the architecture profession as an expert in green architecture, as well as being an internationally acclaimed designer. Brett Gallagher of Corsair Constructions brought a strong commitment to implementing the environmental initiatives within the constraints of a commercial project.

Gore Street Properties controlled two neighbouring sites, and the George Street building was originally conceived as the smaller of two buildings of similar type. We held two meetings with the community to explain our design philosophy and plans for the site. The first was held before lodging our application, in the newly completed Catholic Theological College, designed by our architect Greg Burgess. (We hoped this would help demonstrate Greg's commitment to design excellence.) What we put forward at this meeting was the concept that had emerged from the pre-design meetings, for two related apartment buildings. The decision to go with apartments was a response to both sustainability issues (density, thermal mass, maximising access to northern light etc) and commercial ones – the cost of providing off-street parking (a high priority for both council and residents) in an underground car park. The car park involved a level of expense that could only be recouped by increasing the number of dwellings. The bulk of the proposed buildings was a shock to some residents, but a number of suggestions were made at this meeting (re location of driveways etc) and worked into the plans.



**Figure 2. External front view of apartment complex – existing terraces can be seen on either side.**

The second consultation meeting was held after lodgement, at the City of Yarra offices, and included council planning staff. Personal invitations were extended to everyone attending these formal meetings to review the plans at the house of two of the directors who lived opposite the site in the adjoining street, and to discuss any concerns they might have. A few people took up this option. There were also some meetings at the houses of objectors, where we explained the plans and answered questions.

We went to some lengths to explain our objectives for energy and water conservation and sustainable materials use. However as the project was still in the planning stages, we had not then undertaken an accurate calculation of the environmental outcomes we thought we could achieve. With hindsight it may have been useful to do this, to give extra weight to our claims. But in the end the project failed to gain acceptance with a number of residents, not because of concerns over its environmental performance, but because of concerns about the project's visual bulk, height, and contemporary appearance. Indeed, a few objectors expressed support for the environmental initiatives, but were adamant that this was the wrong location for such an experiment. For most objectors, however, environmental benefits were simply not an issue: their overriding concern was the building's visual appearance which they perceived was inconsistent with the area's heritage.

There was a wide variety of positions within the street regarding the project's merits. Some residents offered support, expressing admiration for our environmental agenda and enthusiasm for Greg's designs. But despite being successful in communicating our vision to a substantial number of people, we by no means got everyone on side, and a passionate core of objectors committed themselves to a crusade against the evils of contemporary architecture.

What followed was a difficult planning process. The City of Yarra approved the project, subject to some conditions that we found acceptable, but residents appealed against the decision. A strong campaign was run against the proposal, and every possible reason to discredit it was put forward. Our ESD initiatives were rejected as 'greenwash'; with some objectors redefining the term 'environment' to mean the visual appearance of a street. Our commitment to providing housing for a range of household types and budgets brought complaints about 'flats', 'renters' and 'students' threatening property values. One objector argued that with all those extra households he wouldn't be able to park his three cars directly outside his five metre frontage terrace house (notwithstanding our proposed underground car park). Our proposal had to go before the Victorian Civil and Administrative Tribunal (VCAT), and after a costly delay we received final approval for the building in George Street, though not for its larger companion fronting Gore Street.

Objectors were particularly strident in their response to the contemporary appearance of the building. While the design embodied what architect Greg Burgess called 'an imaginative and sensitive neighbourliness', we had consciously tried to avoid reproduction architecture, as recommended in Yarra's planning guidelines. Many objectors, however, called for the reinstatement of what they termed the 'timeless elegance' of the architecture of the 1800's, and responded to any contemporary design elements with extreme disquiet. We believe that for these objectors reproduction terrace houses would have been the only solution.

It is difficult to see how we could have avoided the planning delays. Finding another site with fewer potential objectors was not possible, due to the high costs of selling, then locating and purchasing an alternative. We could have built terrace houses, but we would have lost the environmental benefits of achieving higher density in a service-rich area close to the CBD, and it would have been more difficult to achieve good





**Figure 3. External rear view of apartments**

environmental performance (less access to northerly light, natural ventilation etc). We could have reduced the size of the building considerably, but this would have made it uneconomic, and again would have lost the benefits of urban consolidation. There may have been some changes to materials and appearance that could have made it more acceptable to some residents, but our experience was that changes acceptable to one person were unacceptable to another. Further, we were committed to a well-designed, contemporary building, which put us at irreconcilable loggerheads with the hard-core heritage advocates. In the end, it came down to a fundamental difference of opinion: what to us was an appropriate and socially useful project with benefits beyond the financial returns to us as developers and the quality housing enjoyed by purchasers, to objectors was instead a shocking intrusion into their streetscape.

### 3.0 SOCIAL IMPLICATIONS

We believe that our project makes a positive contribution to the community in general, primarily through its contribution to sustainability and urban consolidation (eg reducing pressure for new land subdivision on the urban fringe and its associated requirement for new infrastructure, destruction of habitat etc). Social benefits include contributing to 'critical urban mass', the density that seems to be a necessary precondition for the development of a true urban culture. Furthermore, the project matches housing stock with household type and demand (ranging from larger to smaller households while recognising the trend to the smaller), thereby using resources efficiently and ensuring purchasers need not pay for more housing than they need. It also maintains the social mix that has made Fitzroy such a vibrant place in the past. Finally, by offering lower priced apartments (cheapest \$335,000 for a one-bedroom unit compared to terrace houses costing \$1 million plus), the project keeps housing affordable and also helps maintain social diversity.

A number of objectors were concerned about the impacts of increased population density on their neighbourhood (notwithstanding that Fitzroy has long had a history as one of the most heavily populated areas of Melbourne). Given that people's perceptions and expectations determine how they feel, we must accept that some residents may be negatively affected by our project. However if Melbourne's population increases as expected, and as a society we try to minimise the environmental impacts of one of the least concentrated settlement patterns in the world, then increased densities in already settled areas are inevitable. The challenge is to ensure that people who feel they are unfairly bearing the burden of change understand the necessity of that change, that there are mechanisms for sharing the costs, and that their concerns are heard. We were not successful in this regard and it is something we would spend more time on next time. However these are broader areas of social policy and we do not feel that there has been enough effective discussion – particularly at the local government level – about the need for urban consolidation and its impacts.

Given its responsibility for applying planning and sustainability policy, local government is in a position to play a central role in facilitating discussion about these issues and help resolve planning stalemates. For this project we were initially lucky to have open-minded councillors with a real commitment to public policy and good governance, who were prepared to listen to and assess the advice of their professional planning staff as well as the concerns of residents. However we ran into difficulties later on following a change in the council's makeup. This raises the more general issue that it can be tempting for elected councillors to stay onside with residents and in the process fail to grapple with the complex issues of sustainability and its implications for the long-term well-being of their communities.

### 3.1 Impact on neighbourhood

Possible neighbourhood impacts included shading, overlooking, and change in the visual quality of the street. Shading and overlooking were addressed through the planning process (the plans conformed to the requirements of the Good Design Guide) and the planning appeals process (VCAT). The impacts were deemed to be acceptable. By contrast, a number of residents believed the development would reduce property values, increase density and traffic, overshadow and overlook neighbouring properties, and that it did not conform to their perceived notion of heritage (settlement pattern, appearance, height and visual bulk). These arguments will be familiar to all those who have been involved in urban development projects. There is no doubt that the project has had an impact on the neighbourhood – the issue is whether this is significant, and whether any perceived negatives outweigh the benefits. An inherent issue in projects of this type is that the impacts are local, but the environmental and social benefits are less geographically focussed, more global in nature.

## 4.0 THE BUILDING

### 4.1 Orientation, form and construction system

The site is rectangular with an east-west orientation, with a tall two-storey building to the north, offering limited opportunities for natural lighting and ventilation. The building presents to the street with a west-facing terrace-like appearance, but at the rear apartments are oriented to allow for living areas and courtyards on the northern boundary. The architect worked hard to maximise natural light (one of his design signatures), and include windows accessing more than one aspect to encourage natural cross-flow ventilation and enhance the sense of space. Of the eleven apartments, one has windows facing and opening to only one aspect, six to two aspects, three to three aspects and one to four aspects. The limited area of the site meant there was pressure to fit in as many apartments as possible, to offset the expense of installing an underground car park sized to comply with the City of Yarra's parking policy, which required more spaces than did the Good Design Guide. Set-backs were also determined by planning requirements.

The building is three storeys with a footprint that covers approximately 65 per cent of the site. This generally conforms to Victorian planning requirements, and allows for gardens. The building is constructed of brick veneer over concrete basement with suspended poured slab. Upper levels are timber clad, with other details including metal roofing, steel frame, and a 40mm concrete screed between floors to provide acoustic insulation.

Wherever we could we applied an environmental management approach to construction. This included waste management plans for separation, recycling

and safe disposal of waste materials, and the use of environmental guidelines covering all aspects of the construction process. Under the terms of the standard subcontract agreement, all subcontractors engaged by the builder participated in these plans and guidelines.

### 4.2 Materials

Wherever possible we sourced sustainable materials. Our sustainability consultant Alan Pears played a central role here, bringing an extensive knowledge of products and sources, in part from his experience with the Australian Conservation Foundation's 60L building. Having a consultant, architect and builder all committed to incorporating sustainable materials helped immensely, with each offering suggestions and ideas. Having a close working relationship with the builder avoided having to spell out this requirement in the contract.

We used recycled materials in the building both to reduce the demand for new resources and in some cases to reduce embodied energy. Fly ash was used as a cement extender (60 per cent), without loss of strength or finish, along with ARC Smorgon steel reinforcing mesh containing a high proportion of recycled steel. Recycled wood was used in the stair treads, balcony and banister rails, and polished stone off-cuts were used to form the floor of the common entry. Comcork, a flooring product incorporating used wine corks, was used on the stair landings and in several bathrooms and kitchens.



**Figure 4. Foyer and stairwell for apartments**

Timber selection was an important aspect of sustainability for us. For formwork we used plantation pine plywood, rather than the more usual tropical rainforest-derived product. External timber cladding and fencing was radially sawn Victorian silvertop ash from the timber company Radcon. Although harvested from native forests, radial sawing allows use of younger trees and increases sawn yield, making efficient use of regrowth forest resources. Internal framing timber was plantation pine, and extensive use was made internally of radiata-core plywood faced with plantation hoop pine from plywood manufacturing company Brimsboard. Due to our inability to source an environmentally appropriate hardwood we used pine for skirting boards, architraves etc, though the softness of the timber meant we had to accept some damage which impacted on the finished appearance.

We were unable to source sustainable timber for the window frames. The most common material, western red cedar, is a coastal north-west pacific coast species from America– the closer the growth rings the older it is. We counted the rings in ours and there is no doubt the wood was from trees many hundreds of years old. We have not yet found a suitable replacement and would give greater thought to this next time.

### 4.3 Energy efficiency

We consider our main contribution to energy efficiency and reducing greenhouse gas emissions was to increase the number of households close to work, services and public transport, thereby reducing car use. An evaluation of residents' actual transport patterns would help assess whether or not this is so.

Beyond this, our objective was for all apartments to achieve at least five star minimum energy efficiency, under SEAV's 'FirstRate' assessment tool. Our sustainability consultant reviewed the designs on an ongoing basis, and made recommendations on how to improve their performance. Amongst the measures we used were:

- Thermal bridging of windows and external doors – aluminium externally (to minimise maintenance costs), with wood to the inside to reduce both heat loss and heat gain through conduction
- Natural flow-through ventilation - while maintaining security by using elevated, awning windows with limited openings
- Draft-proofing of doors and windows
- Double glazing to windows, though only where required to achieve the energy rating to keep costs down.
- Reduction in the size of some windows to reduce heat loss (south) or heat gain (north); this is a trade-off between energy efficiency and the market's desire for large windows, lots of natural light and views
- Insulation minimum R2.5 throughout.
- Insulation of slab only in areas where required to achieve energy rating to reduce costs

- Provision of skylights – numbers were limited by cost, and there is a trade-off between light obtained and thermal performance (undesirable heat loss and heat gain)
- Use of lightwell in the most hard to light space
- Provision of a centralised solar hot water service with gas boosting, as well as a heat trace on pipes to taps in the most distant apartments. (Though shared, the centralised gas-boosted service was much cheaper for residents than installing individual metered gas systems to each apartment - estimated annual cost for gas to each household was equal to annual supply charge for an individual meter.)
- Artificial lighting was generally energy efficient – we used low watt globes in many applications.
- Natural gas stoves
- We researched and sourced and installed energy efficient appliances (dishwashers, washing machines) for purchasers who wanted them. Several took up this option.



**Figure 5. One of the kitchens in the complex**

Split cycle air conditioners were installed in all apartments to supplement the passive energy management systems. Marketing issues influenced this decision, but we hoped that the environmental measures undertaken would control the temperatures inside the apartments to within a comfortable range requiring the air conditioners to be used less frequently. Anecdotal reports from occupants have confirmed that this has been the case.

Once completed the apartments were checked again by our sustainability consultant. They range from 5.5 stars to 7.5 stars and average just over six under SEAV's 'FirstRate' system (strictly speaking the SEAV does not formally recognise star ratings higher than 6 at present). Assuming two persons per apartment, these measures



save 10 tonnes of greenhouse gases per year when compared with a standard 2.5 star rated two person apartment. This is the same amount as produced by two cars in a year.

A range of other measures were taken elsewhere in the building to improve energy efficiency. These included:

- The underground car park uses a combination of natural ventilation with a mechanical fan that is triggered by a carbon monoxide sensor, so it only operates when it needs to.
- Energy efficient lighting in common areas is movement triggered, supplemented by natural lighting (including a skylight with solar controller to reflect western sun but transmit easterly light.)
- Use of selected recycled materials in construction wherever possible eg fly ash, reinforcement mesh
- Provision of bicycle parking to encourage non-polluting transport
- Body corporate rules specifying use of 'Green Power' electricity for common areas

#### 4.4 Water

Water efficiency was achieved by installing a 50,000 litre rainwater tank underneath the car park floor, with stored water used for toilet flushing and gardens. We also installed water efficient fittings in bathrooms and kitchens. Heat traces on hot water supply pipes also reduce wastage and we sourced water efficient appliances for a number of purchasers. Overall we calculated that demand on external mains supply in the George Street apartments would be 140 litres per day per person, compared with an average of 250 litres per person in a standard apartment. This is a reduction of 45 per cent in each person's claim on Melbourne's water supply system.

Greywater is discharged to sewer. Some reduction in greywater generation is achieved by providing water efficient appliances and taps in kitchens, bathrooms and laundries. The storage tank has some capacity for storage of peak stormwater flows. This is then discharged once the peak has abated to the external stormwater system, reducing pressure on public infrastructure.

#### 4.5 Landscape and landscape management

Landscaping was designed by Taylor Cullity Lethlean. Plants have been selected according to aspect – more tender, shade tolerant plants for the south, more drought tolerant species for the dryer north. Water is supplied to both public and private garden areas from the 50,000 litre storage tank, delivered by an automatic sprinkler system.

### 5.0 POST OCCUPANCY EVALUATION

Evaluating how successful our environmental initiatives have been will allow us to identify where we have succeeded and where we could improve performance in our next project. In another sense, evaluation helps verify the claims we have made regarding environmental performance, and is important in building a credible company profile. More generally, an increasing number of housing developments are claiming to be environmentally friendly, and there is a need for some process to assess these claims. False claims feed distrust and uncertainty in the market, which undermines the potential for developers offering products with real environmental benefits to charge a premium.

An evaluation of a building's performance must also include feedback from the users as to its convenience, liveability and comfort. Is there adequate natural light and ventilation? Is it cool in summer and warm in winter? Does the rainwater system function properly? It is all very well to provide environmental features, but if apartments do not meet the needs and expectations of occupants, the market will respond by choosing a product that does. Given our experience of most purchasers showing a lack of interest in the environment, green developments will need to compete with their non-performing counterparts on the basis of appearance, apparent value for money, comfort and amenity as well as a host of other features that bear no relationship to ESD. Occupant surveys will help identify where we are failing in this regard. For the George Street apartments, we had preliminary discussions with the Centre for Design at RMIT University to undertake both general evaluation and post occupancy surveys. To assess the performance of the water tank we have engaged Earth Systems Pty Ltd to measure and log inflows and outflows, hopefully with the assistance of a grant from the Department of Sustainability and Environment. Firstly however we must ensure that all systems are working to specification, otherwise the figures will not give a true reflection of performance. For instance, some of our apartments have experienced problems with the hot water system, meaning taps must run for several minutes before hot water is delivered. This wastes both water and energy, and rectification must be completed before a meaningful evaluation can be undertaken. We are aiming for evaluation by 2006.

Commercial developers must complete projects and move on to the next as soon as possible, and they have an understandable reluctance to maintain involvement with a project in which they have no ongoing financial interest. This raises the issue of who will conduct evaluations. Making arrangements for the conduct of evaluations with appropriate research organisations, consultants and professional bodies may be a way around this. Body Corporate rules could provide a means of gaining access to the building and cooperation from the occupants once the developer has moved on. The cost of evaluations should be factored into the

project from the outset, and paid by the developer prior to quitting. Where possible, mechanisms for measuring the performance in terms of water and energy should be incorporated into the fabric of the building and its systems from the outset, avoiding costly retrofitting. To enable the knowledge gained by these evaluations to be used effectively by the industry in general there needs to be a central 'clearing house' where data can be stored, collated, analysed and made available. This is already done to some extent by existing professional, industry and research organisations, although a more systematic and coordinated approach from industry and governments is required.

## 6.0 MARKETING OPPORTUNITIES

Promoting and marketing the project as a 'green building' was something that we had planned for from the outset. We prepared a brochure outlining the environmental benefits of the building, including the likely water, energy cost and greenhouse gas savings for each apartment, and developed a marketing campaign incorporating our environmental message.

Selecting an appropriate real estate agent to sell the project can be important. While the company we used was broadly sympathetic, the sales campaign was conducted from our offices and we were present to assist the agents, who referred any questions of water use, energy savings, and environmental performance to us. This allowed us to give correct technical information to potential buyers, and to communicate our enthusiasm for the environmental features directly. We believe this helped give a sense of authenticity to our project.

In the end, however, it seemed that the environmental features were a significant factor for only a few purchasers. Issues of price per square metre, size, and presence of features perceived as representing quality such as stainless steel cook tops and granite bench tops, were more important for most prospective buyers. Unfortunately many ESD design elements are hidden 'under the skin' and their benefits are not immediately apparent, and may only manifest over time (e.g. energy cost savings). Furthermore, many of the benefits they



**Figure 6. Interior of a three bedroom apartment**



**Figure 7. Interior of a one bedroom apartment**

yield are public rather than private goods, which most individual purchasers are not yet prepared to pay for. It is possible that for some purchasers the high level of research and design involved in providing the environmental features was a surrogate measure for quality in general, and enabled us to receive a slight premium over similar sized and featured apartments. There is no doubt Greg Burgess's beautiful design helped in this regard.

## 7.0 LESSONS FOR THE FUTURE

- Find a project in an area with a sympathetic local council which is prepared to work with you to facilitate the project's progress. On the other hand, do not assume you will get any favourable treatment. Find a suitable location, where planning issues and costs will be minimised. Unfortunately the best location for apartment development is in the inner and inner fringe city areas, where objections are often strongest.
- Obtain input from an experienced and expert sustainability consultant from the outset – environmental features are much more effectively and cheaply incorporated if they are part of the initial concept and design rather than added on at a later stage.
- Select and work with architects and builders who are committed to and experienced in ESD building. Many opportunities for achieving ESD only manifest at unexpected points in the design and construction process, and it may not always be possible to document and contract for these at the outset.
- Identify environmental features that will yield a genuine and significant ESD benefit, and work out how to deliver these at the lowest possible cost. (It may not be necessary to double glaze all windows to attain energy efficiency, for instance.) Set targets for performance, either in relative or absolute terms, but do not let these constrain further gains if opportunities present themselves. As a general approach you may prefer to identify



one or two key ESD features and work these hard, or you may look for ESD gains across a wider range of areas.

- Get the most up to date information available on techniques, products, and services – use the best consultants you can get in all fields and research thoroughly, using all available sources including websites, journals, and information from industry and government bodies. Products change, go out of production, new processes are always being developed.
- Allow for the failure of mainstream suppliers to recognise and meet demand for 'green' products. Work as closely with suppliers and contractors as possible – the more requests for 'green' products and services they get the sooner they will make them available.
- Always keep marketability in mind when planning for and incorporating ESD features. Aim to provide the same level of features, quality and value as similar products without the environmental performance. Never suggest to potential buyers that sustainability needs to be traded off against quality and comfort. In our experience many of the purchasers were not yet prepared to value environmental benefits.
- For both marketing and evaluation purposes, work out as best you can just what the benefits of your environmental features are – financial (e.g. cost savings to occupier, access to lower-interest housing loans), convenience (e.g. avoid water restrictions), and the 'feel good' factor. Get the help of a consultant when doing your sums.
- Plan and budget for evaluation at the outset – integrate metering systems if necessary, commit to a post-occupancy assessment, and work out how to get the participation of the occupants or owners once you have moved on. Ensure the information is made public – publish or pass on to a government, industry or research/educational organisation so that your experience adds to the general body of knowledge on ESD.
- Consult with residents and communicate your environmental and design message clearly and as often as possible, but do not assume you will earn any reward points in the planning process. In some situations accepting less than optimal aesthetic design outcomes may be necessary to gain community support.
- Perhaps most important is the need for leadership on the part of government. State government regulation such as the mandatory requirement that new housing meet energy targets is critical to creating a market for the products and services required to build sustainable buildings, and for the buildings themselves. The next valuable step would be to introduce a similar requirement for efficient water use. The planning system also needs to be examined to ensure that sustainability is given adequate weight in planning

decisions. Unfortunately at present Melbourne's charged planning climate does not appear to be conducive to effective consultation, participation and education. Urban consolidation and its environmental benefits is often in conflict with residents who want to maintain the status quo. A willingness on the part of local government to engage with these issues in the interests of good long term policy, rather than short term political advantage, will make a very significant contribution to achieving sustainability.

## BIOGRAPHY

Steve Mathews has a background in environmental science and worked as a consultant in this field for a number of years, before joining up with his sister and brother-in-law to undertake the development of a number of family properties. He has a particular interest in integrating sustainability with current practices in planning and development, land use and natural resource management.

---

*The views expressed in this Note are the views of the author(s) only and not necessarily those of the Australian Council of Building Design Professions Ltd (BDP), The Royal Australian Institute of Architects (RAIA) or any other person or entity.*

*This Note is published by the RAIA for BDP and provides information regarding the subject matter covered only, without the assumption of a duty of care by BDP, the RAIA or any other person or entity.*

*This Note is not intended to be, nor should be, relied upon as a substitute for specific professional advice.*

*Copyright in this Note is owned by The Royal Australian Institute of Architects.*