ENVIRONMENT DESIGN GUIDE

SUSTAINABLE COMMUNITIES

Danielle McCartney and John Doggart

SUMMARY OF

ACTIONS TOWARDS SUSTAINABLE OUTCOMES

Environmental Issues/Principal Impacts

- Energy efficiency and greenhouse gas abatement, sustainable transport, water conservation, pollution prevention, enhanced land and biodiversity, improved social opportunities, resource efficiency and waste avoidance.
- Self-sufficiency, financial viability, social amenity and consideration for the environment.
- Expanding population and insufficient land, resources and services to support the population in a sustainable manner.
- The integration of mixed-use land development and transport infrastructure.
- The grouping together of sustainable buildings to create sustainable communities.

Basic Strategies

In many design situations, boundaries and constraints limit the application of cutting EDGe actions. In these circumstances, designers should at least consider the following:

- Diversity – An integrated mix of household sizes, cultures, ages and incomes, housing types, densities, tenures and land uses creates vibrant communities.
- Amenity – Establish communities able to support basic facilities and neighbourhoods with well-designed public spaces.
- Connections – Establish transport links within the neighbourhood, to local amenities, to other local communities and to regional centres.
- Long-term benefits – Commit to the philosophy that greater overall returns can be produced by a higher upfront investment.
- Flexibility – Adapt to change and plan for future needs.
- Participation – Promote active participation in the decision-making process for the planning, development and long-term management of the community.
- Environment – Commit to minimising the impact of the community on the environment.
- Responsibility – Act in a responsible manner to achieve reductions in consumption.
- Economy – Provide employment opportunities to meet the projected needs of the community.
- Health – Prioritise the health, well-being, comfort and social amenity of residents.
- Safety – Integrate environmental design to reduce the opportunities for crime.

Cutting EDGe Strategies

- Develop a sustainable design brief and comprehensive sustainability strategy.
- Set short-term and long-term sustainability performance targets.
- Monitor performance and measure progress towards targets from the outset.

Synergies and References

- Brownhill and Rao, (2002). *A Sustainability Checklist for Developments*, Building Research Establishment, Watford, UK.
- COAG, (1992). *National Strategy for Ecologically Sustainable Development*, Council of Australian Governments, Canberra.
- Gauzin-Muller, D., (2002). *Sustainable Architecture and Urbanism*, Birkhauser, Basel, Switzerland.
- Institute for Sustainable Futures, (2001). *Your Home Technical Manual*, Commonwealth of Australia, Canberra.
- Kam, M., (1999). *Sustainable Architecture: Identifying Obstacles and Possible Strategies for the Australian Building Industry*, PLEA 1999: 16th International Conference on Passive and Low Energy Architecture, Brisbane.
- WCED, (1987). *Our Common Future*, World Commission on Environment and Development, Oxford University Press, Melbourne.
- *BDP Environment Design Guide:* CAS 15, CAS 21, CAS 31, DES 47, GEN 17, GEN 40, GEN 60

ENVIRONMENT DESIGN GUIDE

SUSTAINABLE COMMUNITIES

Danielle McCartney and John Doggart

As Australia faces a number of challenges, including water shortages, rising fuel costs, expanding population and insufficient land, resources and services to support it in a sustainable manner, there is a growing need to address these issues, adapt to change and plan for future needs. The creation of sustainable communities is a timely response as they have a high degree of self-sufficiency, financial viability, social amenity and consideration for the environment.

1.0 INTRODUCTION

This note is based on a lecture series presented around Australia entitled 'Profiting from Sustainable Communities: How community, business, and the building industry can achieve and benefit from environmentally responsible design.' This RAIA-organised tour, as part of the Year of the Built Environment 2004, was supported by the Australian Greenhouse Office, the Australian Institute of Building Surveyors, and the BDP Environment Design Guide.

The nature of sustainable communities and their benefits is outlined, as distinct from conventionally planned developments, as well as the drivers and incentives for the various sectors of the building industry to create them. The degree of sustainability of these communities and how it can be measured is addressed. The barriers to progressing the development of sustainable communities are identified and the means to overcome them are discussed. Finally, a range of examples of established sustainable communities from Australia and Europe is presented.

2.0 CONTEXT

The best known definition of sustainable development is from the 1987 report of the World Commission on Environment and Development (WCED) entitled 'Our Common Future' (also known as the Bruntland Report): 'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.

Australia has adopted the term 'Ecologically Sustainable Development' or 'ESD', which is derived from the 1992 National Strategy for Ecologically Sustainable Development. ESD is defined as 'development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends'. The three core objectives are:

- Enhanced individual and community wellbeing through economic development that safeguards the welfare of future generations
- Inter-generational equity
- Maintenance and protection of bio-diversity and the essential ecological processes and life-support systems

3.0 SUSTAINABLE COMMUNITIES

There has been much discussion about the qualities and benefits of sustainable buildings, but a great deal less about the greater planning issues, how these sustainable buildings are grouped together to form communities and what constitutes a sustainable community.

Sustainable communities have a high degree of self-sufficiency, are able to adapt to the changing demands of modern life, while planning for the needs of future generations. Sustainability is achieved through a balance of the three inter-dependent issues of social, environmental and economic development. For a community to be considered sustainable, its design, development, construction, operation and management must be financially viable, its environmental impacts minimised or eliminated, and its social opportunities enhanced.

Sustainable communities comprise well-designed comfortable homes and buildings that meet the needs of the local community and require the minimum use of resources over their lifecycle. Conserving energy and reducing demand for water lowers utility costs for owners and tenants. Waste, and the associated costs of disposal to landfill, is reduced. Use of healthy building materials improves indoor air quality and occupant health. Use of sustainable transport reduces transport energy and reduces air pollution. Economically, sustainable communities encourage the generation of local jobs and employment opportunities and facilitate home-based employment.

As demonstrated by the case studies outlined in Section 8.0, sustainable communities can be broadly defined. Sustainable communities can comprise a single building of integrated mixed uses (such as retail, commercial and residential activities) or consist of a collection of buildings, a planned development, a suburb, a town, a city or a region.

Typically, sustainable communities include the following features and qualities:

3.1 Diversity

Sustainable communities are vibrant and diverse. The community comprises an integrated mix of housing types and tenures. The neighbourhood is a mix of appropriate densities and supports a range of land uses, including residential, commercial, industrial, retail and leisure activities. Sustainable communities encourage social cohesion and pride in the community, support a diversity of cultures and contain a wide range of household sizes, ages and incomes. Housing affordability is a consideration and the mix of residential buildings would include integrated housing for lower income families.

3.2 Amenity

The community is an adequate size, scale, layout and density to support basic amenities, such as health care, education, leisure and community facilities. The neighbourhood has well-designed public spaces and green spaces for residents and users.

3.3 Connections

A sustainable community has established transport links (particularly public transport) within the neighbourhood, as well as connections to local amenities, other local communities and regional centres. The neighbourhood has a sense of community identity and maintains strong links with the wider region.

3.4 Long-term benefits

The development of conventional communities usually entails lower up-front expenditure at the outset in order to produce a quicker return. Sustainable communities require a paradigm shift in thinking, towards the philosophy that greater overall returns can be produced by a higher upfront investment. The savings and benefits flow over the life of the buildings and community, such as reduced water and energy costs, enhanced biodiversity and improved social amenity.

3.5 Flexibility

Sustainable communities plan for the future and are flexible enough to accommodate the changing needs of people.

3.6 Participation

In addition to passive consultation undertaken by developers and local authorities, a sustainable community promotes active participation by the local residents, workers and businesses in the decision-making process for the planning, development and long-term management of their community.

3.7 Environment

A sustainable community minimises its impact on the environment. Energy consumption, and the resultant greenhouse gas emissions, is reduced. More environmentally friendly forms of energy, such as renewables (e.g. wind and solar power), are sourced. Alternatively, sustainable means' of transport are encouraged. Pollution of air, water, soil and the atmosphere is prevented or minimised. Resources, such as building materials, water and energy, are conserved and used efficiently. Wastage of resources is minimised or avoided and recycling and re-use of materials is encouraged. Damage to land and ecology is minimised and biodiversity is preserved and enhanced.

3.8 Responsibility

Community members act in a responsible manner, aiming to reduce their own domestic energy and water consumption, generate their own energy, re-use water and manage household waste.

3.9 Economy

A flourishing mixed-use neighbourhood provides employment opportunities to meet the projected needs of the community and to create wealth supporting it. The viability of local businesses is ensured by an appropriate intensity and mixed-use concentration of land uses. Good infrastructure is provided to link key trading centres by both public and private transport.

3.10 Health

A key priority in sustainable communities is the health, wellbeing, comfort and social amenity of residents. The thermal comfort and health of the occupants of the buildings is considered and ensured through the use of healthy building materials, efficient technology and public and private spaces that provide amenity.

3.11 Safety

A sustainable community uses environmental design to reduce the opportunities for crime and to ensure the safety and security of the residents.

4.0 DRIVERS

The concept of sustainability and the need to create sustainable communities has evolved as a response to the following issues faced by the world:

- Global warming, climate change and finite fossil fuel resources
- Depletion of the ozone layer
- Loss of biodiversity
- Air, water and soil pollution
- Over-consumption of resources
- Rising sea levels
- Population increase
- Urban sprawl
- Basic access to water, food, health and sanitation
- Social inequality

The sustainability issues specific to Australia include:

- Depletion of the ozone layer
- Scarcity of fresh water
- Drought
- Increased incidence of bushfires
- Floods
- Coral bleaching
- Deforestation and land clearing
- Erosion
- Increased salinity
- Expanding population in urban areas

There are a number of drivers and incentives that are encouraging various participants in the design,

development, planning and construction sectors to develop sustainable communities.

The small, but growing, demand for higher quality developments that consider the social and economic needs of the people is encouraging developers to produce sustainable communities. Developers gain a reputation for producing quality developments, resulting in increased business. With local councils now beginning to place greater emphasis on sustainability, developers may find that by including sustainability initiatives they are granted planning permission more quickly. Developers can sometimes negotiate planning concessions for environmental considerations. Grant and rebates schemes have been successful in encouraging developers to install environmental technology, such as solar water heating systems. Those developers taking advantage of these schemes early on will gain the sustainability marketing advantage over late-comers. Other incentives could include tax-deductions for the installation of environmental technology.

Governments have a vested interest in assuring the long-term future of their people. Drivers for the local, state and federal governments to produce sustainable communities include pressure to respond to the economic, social, environmental and political agendas of their constituents, i.e unions, activists, welfare and lobby groups and non-government organisations. Governments need to develop their own policies, set targets and meet them, as well as respond to international policies and benchmarks. The Australian Government has committed itself to the 1992 National Strategy for Ecologically Sustainable Development policy, the Mandatory Renewable Energy Target (MRET) and greenhouse gas emission abatement targets. In addition, there are several state and local governments showing leadership in implementing measures with the aim of achieving sustainable outcomes.

In order to deliver community benefit to residents and to ensure the long-term future of local councils and businesses, planners are promoting the regeneration of existing neighbourhoods and the creation of sustainable communities by planning for future needs. Planners are in a position to show leadership by working beyond the regulatory framework, setting exemplar ESD standards that must be achieved by developers in order to gain planning permission.

Champions aim to safeguard community needs by preserving resources and the environment for future generations. They also 'future-proof' against changes in legislation and potential rises in energy, water and waste costs. These activists are driven to create sustainable neighbourhoods in order to demonstrate the principles of ESD.

Increasingly environmental weightings are used to differentiate between design teams competing for tenders. The potential for increased work opportunities is an incentive for design teams to include sustainability in their submissions. Design teams interested in participating in the development of sustainable communities can gain experience and knowledge in the field of ESD, thereby increasing their skill-base and credentials for future projects.

Companies are increasingly responding to pressure for corporate social responsibility and market demand for high quality working environments by creating sustainable buildings that improve the local community. Implementing sustainability initiatives can increase leasability of office spaces, lower energy bills, improve occupant health and well-being, and increase worker productivity. Companies implementing sustainable practices benefit by increasing both their public profile their ability to transparently report at a time where there is growing interest in ethical investment, thus improving corporate survival.

5.0 DEFINING 'GREEN'

To date there has been a lot of 'greenwash' in the building industry about the environmental credentials of buildings. A building may be deemed to be 'green', or 'sustainable', but when credentials are analysed, the building may have good energy efficiency and water conservation aspects, but other issues, such as social amenity or material selection, may have been neglected. Currently, there is a lack of established rating schemes, either voluntary or mandatory, in the Australian marketplace that measure the overall performance of buildings and communities in terms of sustainability, taking into account aspects such as transport, air pollution, use of energy, water and resources, waste, social amenity, land use and biodiversity.

However, there are a number of established rating tools available in the Australian building industry that measure singular aspects of a building's performance, such as energy efficiency. The most commonly used tool for new residential dwellings is NatHERS, which predicts demand for heating and cooling energy based on the thermal performance of the building envelope. Other tools include BERS, ACTHERS and FirstRate. For existing commercial buildings, there is the Australian Building Greenhouse Rating (ABGR) tool, which measures operational energy consumption. The residential rating tools are an established part of the planning approval process, either as part of the Building Code of Australia through individual state amendments or as a mandatory requirement of local council development controls.

Sustainability rating tools can only measure what can be quantified, but nevertheless are a good indication of holistic performance and allow the benchmarking of buildings for comparison against each other. Other countries, such as the UK, US and Canada, have established schemes that benchmark sustainability on a voluntary basis. The Building Research Establishment Environmental Assessment Method (BREEAM) was the world's first sustainability rating tool launched in 1990 in the UK. BREEAM schemes include EcoHomes and Office, Retail and Industrial Units. The US Green Building Council's Leadership in Energy and Environmental Design (LEED) was developed around

1999. LEED includes new, existing and renovated commercial buildings, shell and core, commercial interiors and homes.

Some schemes for rating the holistic sustainability performance of buildings are under development in Australia including NABERS, Green Star and BASIX. These schemes will allow us to define 'green' by establishing a common standard of measurement. The Building Sustainability Index (BASIX), currently being developed by the NSW Department of Infrastructure, Planning and Natural Resources (DIPNR), is a web-based rating tool that rates the sustainability of residential developments at the planning stage. Currently, only the energy and water components have been launched and form part of the NSW regulatory planning framework. BASIX builds on existing rating tools, such as NatHERS and sets mandatory targets for new detached housing in the Sydney metropolitan area. The Green Building Council of Australia Green Star schemes measure the sustainability of commercial buildings and include Office Design, Office Existing, Office Interiors and Office as Built. Green Star is based on BREEAM and LEED, is nation-wide and voluntary. The Department of the Environment and Heritage's National Australian Built Environment Rating System (NABERS), currently in the process of commercialisation, is a nationwide scheme that benchmarks the operational environmental performance of an existing office, office tenancy or residential dwelling.

Whilst most of the tools outlined above are for single buildings or buildings of particular types or uses, the sustainability performance of a mixed-use community may be able to be measured using a combination of these schemes (as with the UK's BREEAM scheme) or a new scheme may be developed that particularly focuses on mixed-use communities.

6.0 BARRIERS

There are a number of existing barriers that need to be addressed and removed in order to create sustainable communities. Barriers include:

- an industry focus on short-term rewards
- a lack of consistent government and local authority leadership
- inadequate legislation and development controls
- inflexible mandatory controls
- insufficient active community participation in the planning process
- a general lack of education.

One of the most significant barriers to delivering sustainable communities is that typically developers are not prepared to finance the additional capital costs often required upfront for ESD initiatives, the benefits of which are generally reaped in the long term, as they are not the end-users of the buildings and developments they create. Concurrently, prospective home-buyers typically esteem floor space, location and quality fittings in preference to ESD features and are often not prepared to pay more than for conventional homes.

Lack of legislation forcing developers to implement sustainability initiatives is a barrier to developing sustainable communities, as the building industry is reluctant to change from their 'business as usual' operation. The building industry tends to be driven by market need or waits for change to be mandated. In the near future, mandatory energy targets will be integrated into the Building Code of Australia (BCA) for all building types nation-wide. Unfortunately, it will be some time before mandatory ESD targets are integrated into the BCA. Conversely, some existing mandatory controls and rating tools have been perceived as being too rigid and prescriptive, potentially stifling design innovation and experimentation.

Despite a general lack of participation by the local community in the planning process, the objections of a vocal minority can be a barrier to the development of sustainable communities. This is usually the consequence of a fear of the unknown and a lack of understanding of ESD and its benefits.

There is a general lack of education at all levels amongst developers, design professionals, governments, local authorities and the community as to what sustainability means and what its benefits are.

7.0 OVERCOMING THE BARRIERS

Gauzin-Muller, French architect and sustainable design expert, believes that the following aspects must be in place for a sustainable community to be successfully delivered:

- Commitment of the elected authorities and administration
- Willingness of all parties to collaborate, including businesses and local community groups
- Active participation of residents
- Integration of professional expertise, including architects, engineers, planners, landscape designers, technical experts and local authorities.

Education is the key to overcoming many of the barriers to ensuring that sustainable communities are delivered. The community, developers, design professionals, government and local authorities all need access to information on sustainability, such as websites, guidelines and training programmes. Education to raise awareness of the benefits of living and working in a sustainable community is required. A paradigm shift needs to occur to encourage buyers' and occupiers' esteem of the long-term benefits and cost-savings associated with sustainable buildings over conventional building costs. Developers of sustainable communities need to raise the awareness of potential buyers by using sustainability in their marketing. Education on sustainability issues could be delivered through leaflets, newsletters, workshops, an informative website, or a display home or office demonstrating sustainable design.

The community should actively participate in the planning process from the outset, not merely be consulted when major decisions have already been made by the design team. This is particularly relevant for regeneration projects and has been successfully undertaken in the preliminary stages of the Ballymun project (see Case Studies) where a number of workshops were held with local residents to gain their input into the nature of the community and buildings they envisioned. The local authorities need to show support for the project, as both government and community support is vital for the successful delivery of sustainable communities.

There is a need to speed up the process of legislation and mandated controls relating to ESD, while allowing for the flexibility to accommodate innovation in the future. Local authorities need to demonstrate strong leadership by introducing comprehensive ESD requirements into development controls. Mandatory public disclosure of ESD performance when properties are sold or leased would be a powerful mechanism to increase transparency and drive change. Voluntary guidelines and schemes can play an important role in raising awareness and as a market differentiator between developments.

Federal, state and local governments currently provide funding for a variety of community needs including transport, health, schools and public open spaces. However, they need to demonstrate their commitment to sustainability by increasing the funding available for the research and development of sustainable technology and the production of sustainability guidelines.

Although generally insufficient to balance higher upfront costs, there are a range of grants, funding and rebate schemes available for ESD technology and initiatives that provide some assistance to homeowners in overcoming the capital cost barrier. These schemes aim to assist and increase the take-up of sustainable technology to a point where upfront costs are reduced and become more affordable as more people adopt the technology.

The successful creation and delivery of sustainable communities can be repeated through long-term collaboration. Design teams, contractors and developers that maintain partnerships and continue working together on sustainable developments can reduce lead-up time, effort and costs, as knowledge, lessons learned and experience gained is retained. Forming alliances with experts in the field, such as universities or NGOs, can bring expert knowledge to the project and raise its profile.

Lessons in overcoming the barriers can be learned from the many successful established sustainable communities in Australia and overseas.

8.0 CASE STUDIES

Outlined below is a selection of Australian and European sustainable communities under the incentives and drivers for creating them. While all of the case study projects feature a wide variety of 'sustainability' features and are making steady progress toward sustainability, there is still a long way to go in order to achieve real sustainable outcomes.

8.1 Developers: getting planning permission and meeting market needs

The Wixams, Bedfordshire, UK

Elstow Garden Village meets the government's long-term strategic housing and employment needs, providing housing for 12,000 people on a brownfield site. In order to meet the planner's demands and gain planning permission, a site-wide sustainability strategy was developed, including target setting using the BREEAM Office and EcoHomes rating schemes. Sustainable initiatives in this high density mixed-use development include integrated public transport, pedestrian and cycle friendly layout, renewable energy generation, a three-tier waste recycling scheme and an innovation fund to promote pilot projects. Construction is due to start in early 2005 and be completed in 2006.

Newington, Sydney, NSW, Australia

LendLease and Mirvac formed a joint venture to bid for the development of Newington Village at Olympic Park. Their winning bid included a sustainability strategy that responded to the Olympic Coordination Authority's ESD guidelines and set targets. The Village was designed and built according to ESD principles, featuring Passive Solar Design and the installation of active technology, such as photovoltaics and solar panels for water heating. The LendLease/Mirvac team won the tender, gained planning permission and responded to market needs by integrating ESD principles and environmental technology with a traditional architectural style.

8.2 Government: assuring long term future

Greenwich Millenium Village, London, UK

The Greenwich Millenium Village, consisting of 1300 homes, is an example of the government planning to meet future housing and employment needs through the incorporation of sustainability aspects and urban consolidation. The government set a sustainability brief for the competition to develop this brownfield site near central London. The winning design team developed a strategy to implement sustainability initiatives with the aim of meeting government targets to reduce energy and water consumption and waste generation. Work on the Village began in 1999 and was completed in 2002.

Cotton Tree, Maroochydore, Queensland, Australia

Two adjacent blocks, owned by the Department of Housing and a private owner, were amalgamated, allowing the preservation of existing ecological features, better land use and quality of community space, and

a uniform design solution. This pilot housing project, completed in 1995, features a diversity of housing types responding to local demographic needs, climate responsive design, use of low embodied energy materials and adaptability for future change. The Department of Housing has assured the longevity of their investment by incorporating sustainability principles into the development. Benefits for tenants include affordable housing, thermal comfort and lower energy bills.

8.3 Planners: delivering community benefit

Bo01, Malmo, Sweden

Sweden's first international housing exhibition aimed at demonstrating sustainability was located at Bo01, which then became the core of a new community in Malmo. Many developers collaborated to achieve a high degree of sustainability in this mixed-use development, which was completed in 2001. One hundred per cent of the energy consumed on site is generated locally from renewable sources such as wind, solar and biogas. The landscaping strategy, including stormwater collection, green roofs and Water Sensitive Urban Design features, aims to enhance local biodiversity.

Doncaster Hill, Melbourne, Victoria, Australia

As a response to the Victorian government's 'Planning Strategy, Melbourne 2030', Manningham City Council has implemented a twenty-year strategy for a number of precincts in Doncaster Hill. Under the Doncaster Hill strategy 2002, a Sustainable Design Taskforce was set up and developers are required to produce a Sustainability Management Plan (SMP), on which they are assessed. Manningham City Council has implemented a strategy that requires developers to incorporate sustainability into their developments with the aim of producing a high density urban village that demonstrates sustainability principles and ensures long term economic, social and environmental outcomes for the community.

8.4 Champions: protecting the future

BedZed, Beddington, UK

Completed in 2001, BedZed (Beddington Zero Energy Development) was built according to sustainability principles and aims to demonstrate that a development can be self-sufficient in energy. All dwellings and live/work units have been designed according to Passive Solar Design principles and consist of super-insulated, draught-proofed thermally massive construction, with high performance glazing and heat recovery ventilation. Other features of the development include an electric car club, grey and black water recycling and use of reclaimed materials. The developers have minimised the impact of the development on the environment and safeguarded this sustainable community from potential rises in fossil fuel costs by attaining self-sufficiency in energy.

Crystal Waters, Maleny, Queensland, Australia

Crystal Waters, set up during the 1980's, is the world's first permaculture village. The 200-strong community own their land freehold, whilst the common land is managed by a Body Corporate. Crystal Waters features a diversity of construction types (e.g. mud brick, straw bale, pole frame) and environmental technology (e.g. photovoltaics, composting toilets). Residents must abide by bye-laws relating to the environment. Crystal Waters aims to demonstrate how development can co-exist with the environment, creating a sustainable community.

Christie Walk, Adelaide, South Australia, Australia

Christie Walk is an initiative of Urban Ecology, a non-profit community based environmental education association. The development prioritises user participation in the design, development and construction process and features a variety of housing types and construction methods, passive solar design, a landscape and water conservation strategy and use of healthy building materials. Christie Walk demonstrates that the active participation of residents can produce a sustainable community on a constrained urban site. The first two stages are complete and the third stage is currently underway.

8.5 Regenerators: setting exemplar standards

Ballymun, Dublin, Ireland

Ballymun is a large-scale urban renewal project of a dilapidated 1950's housing estate. The 2800-dwelling project, made up of a neighbourhood town centre, low-rise diverse housing groups and open spaces, consists of a variety of land uses and densities and aims to attract private sector, commercial and industrial users. A site-wide environmental specification and sustainability strategy, including improved insulation, solar water heating, ground source heat pumps, rainwater collection and passive ventilation is being implemented. Tenant participation and education is essential to the process. Ballymun Regeneration Ltd has set exemplar standards in sustainable urban renewal, achieving long term economic and social benefits for the community. Over 740 new homes have already been built in Ballymun and the remainder are currently under construction.

Kogarah Town Square, Sydney, New South Wales, Australia

Kogarah Council and developers High Trade formed a joint venture to redevelop Kogarah Town Square. This mixed-use development, completed in 2003, provides economic opportunities, features passive solar design aspects, and is Australia's largest solar-powered medium density development. Kogarah Town Square received a number of grants for photovoltaics, energy efficient appliances and water saving technology. Kogarah

Council successfully joint ventured with the private sector to produce a sustainable mixed-use community that is a benchmark of sustainable urban renewal.

8.6 Design Teams: winning competitions

Ancoats, Manchester, UK

The redevelopment of Ancoats, a derelict precinct of Manchester, was the subject of a design competition with a brief that included sustainability. The winning bid included initiatives such as on-site renewable energy generation, 'greenwire' connection to off-site renewable energy sources, ground source heating, a car club, energy swapping between commercial, industrial and residential users and community ownership of energy. The first stages of the redevelopment are currently underway.

Windsor Court, Hobart, Tasmania, Australia

The Windsor Court site, owned by Housing Tasmania, contained a number of buildings that had become unsuitable for the needs of public housing tenants. Housing Tasmania initiated an architectural competition with a brief setting stringent ESD targets. Ecocosm's winning design featured passive solar design aspects, solar towers, water recycling, adaptable dwellings and communal courtyards. The design team's profile was raised in the field of ESD. The competition attracted a wider variety of entries than otherwise possible through normal government procurement policy and Housing Tasmania was able to achieve the incorporation of best practice ESD initiatives into the proposed development, thus ensuring long term sustainable outcomes. The project is currently at construction tender stage.

8.7 Business: enhancing company image, improving survival and responding to stakeholder pressure

Alma Verde, Lagos, Portugal

This development, partially funded by the European Commission, consists of 200 villas and associated facilities and was completed in 2002. The developer responded to local market demands for high quality sustainable homes. Features include the installation of a low energy fan-driven ground cooling system (which avoided the need for air-conditioning) and use of local low embodied energy materials. Benefits for owners and occupiers include a healthy living environment and lower energy bills. For the developer, sales exceeded expectations and the development won numerous environmental awards.

30 The Bond, Sydney, New South Wales, Australia

Lend Lease's new head office has been included as a case study as single sustainable buildings make up sustainable communities and 30 The Bond forms part of a mixed-use live/work precinct. Completed in 2004, 30 The Bond, aims to achieve sustainability outcomes within commercial parameters. Extensive community and staff consultation was undertaken. This passive solar designed building features controllable shading and use of natural materials. It contains the first chilled beam air conditioning system on this scale in Australia and is the first to achieve a 5-star rating in the Australian Building Greenhouse Rating scheme. Lend Lease has created a building that is representative of their corporate image and, as they have a long-term stake in the building, it is designed to be adaptable for the future and will save money on energy bills, operation and maintenance over its lifetime.

REFERENCES

Bateman, G., (2003). 'CAS 31 – Doncaster Hill Urban Village: An integrated approach to sustainability', *BDP Environment Design Guide,* RAIA, Melbourne.

Brownhill and Rao, (2002). *A Sustainability Checklist for Developments*, Building Research Establishment, Watford, UK.

COAG, (1992). *National Strategy for Ecologically Sustainable Development*, Council of Australian Governments, Canberra.

Gauzin-Muller, D., (2002). *Sustainable Architecture and Urbanism*, Birkhauser, Basel, Switzerland.

Gray, P., (2002). 'DES 47 – Windsor Court Redevelopment, Tasmania', *BDP Environment Design Guide,* RAIA, Melbourne.

Hood, D., (2004). 'GEN 60 – Implementing Energy Efficiency and ESD from a Development Perspective', *BDP Environment Design Guide,* RAIA, Melbourne.

Hyde, R., (2000). 'CAS 21 – Cotton Tree Project', *BDP Environment Design Guide,* RAIA, Melbourne.

Institute for Sustainable Futures, 2001, *Your Home Technical Manual*, Commonwealth of Australia, Canberra.

Kam, M, (1999). *Sustainable Architecture: Identifying Obstacles and Possible Strategies for the Australian Building Industry*, PLEA 1999: 16th International Conference on Passive and Low Energy Architecture, Brisbane.

Owen, C., (2001). 'GEN 40 – Implementing Ecologically Sustainable Development', *BDP Environment Design Guide,* RAIA, Melbourne.

Prasad, D. and Veale, J., (1998). 'CAS 15 – Homebush Newington Village', *BDP Environment Design Guide,* RAIA, Melbourne.

Ulterino, M., (1998). 'GEN 17 – Urban Planning for Sustainability', *BDP Environment Design Guide,* RAIA, Melbourne.

WCED, (1987). *Our Common Future*, World Commission on Environment and Development, Oxford University Press, Melbourne.

Web-based resources

Europe

The Wixams, Bedfordshire, UK
http://www.elstowgardenvillages.co.uk

Greenwich Millennium Village, London, UK
http://www.gmvproject.com

Bo01, Malmo, Sweden
http://www.map21ltd.com/scan-green/bo01.htm

BedZed, Beddington, UK
http://www.zedfactory.com

Ballymun, Dublin, Ireland
http://www.brl.ie

Ancoats, Manchester, UK
http://www.auvc.co.uk

Alma Verde, Lagos, Portugal
http://www.almaverde.com

Australia

Newington, Sydney, NSW, Australia
http://www.newingtonvillage.com.au

Cotton Tree, Maroochydore, QLD, Australia
http://www.architectus.com.au

Doncaster Hill, Melbourne, VIC, Australia
http://www.manningham.vic.gov.au
http://www.doncasterhill.com

Crystal Waters, Maleny, QLD, Australia
http://www.ecologicalsolutions.com.au/crystalwaters

Christie Walk, Adelaide, SA, Australia
http://www.urbanecology.org.au/christiewalk
http://www.ecopolis.com.au/projects

Kogarah Town Square, Sydney, NSW, Australia
http://www.kogarah.nsw.gov.au

Windsor Court, Hobart, Tas, Australia
http://www.dhhs.tas.gov.au/housing/windsor_court

30 The Bond, Sydney, NSW, Australia
http://www.lendlease.com.au/

BIOGRAPHY

Danielle McCartney (BArch UNSW, MPhil (Env. Design) Cambridge) is Sustainable Design Manager with Noosphere Ideas in Sydney. Danielle has worked extensively in Australia and Europe, specialising in sustainability in the built environment, in particular the sustainable development of residential buildings, housing projects, mixed-use developments, subdivisions, masterplanning and regeneration of urban areas. Danielle recently co-presented a RAIA-organised lecture series around Australia on Sustainable Communities.

John Doggart, Director of FaberMaunsell in London, has made a significant contribution to the sustainability of the built environment with award-winning projects across the UK and Europe. John was co-presenter in the Sustainable Communities tour.