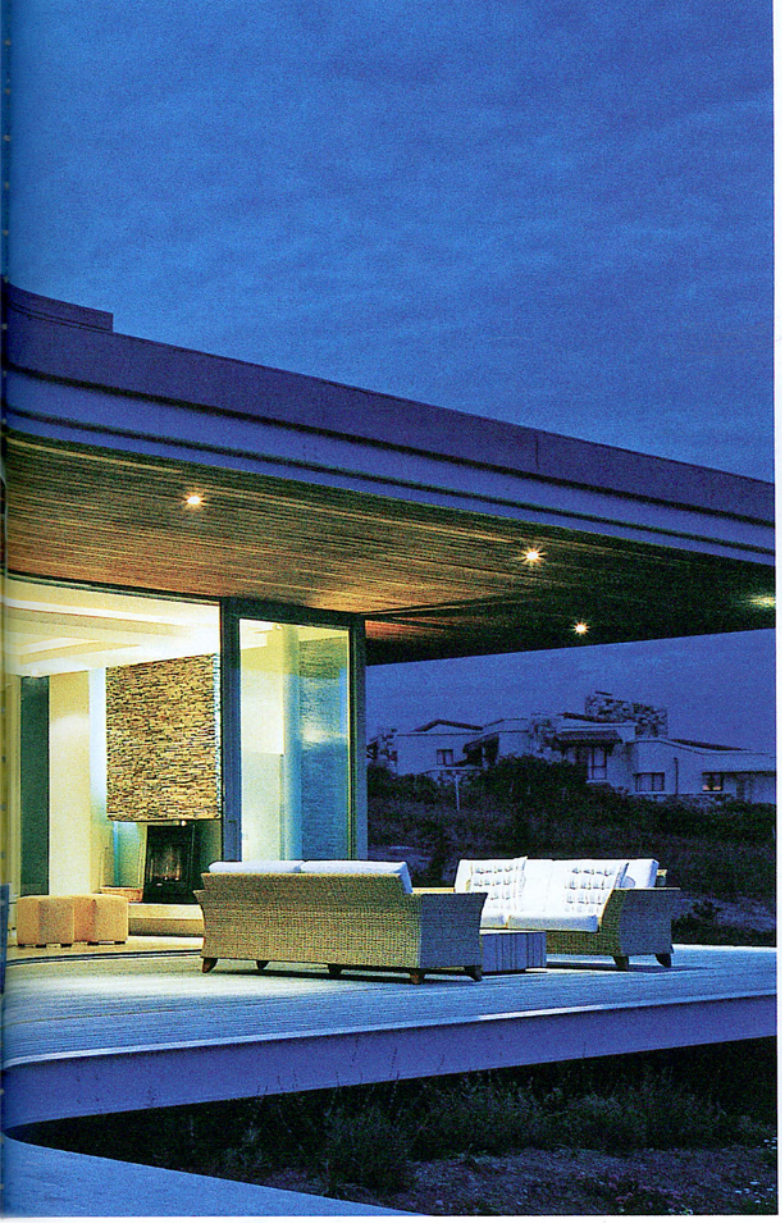
Architecture '09

by Colin Sharp

THIS ANNUAL FEATURE IS SOMETHING WE AT *HABITAT* LOOK FORWARD TO AND THIS YEAR WE'VE SLANTED THE INFORMATION LARGELY TOWARDS ECO / GREEN ARCHITECTURE AND ITS APPLICATION IN THE RESIDENTIAL ENVIRONMENT. TAKING THE SUBJECT IN OVERVIEW, WE ASKED KEY PEOPLE IN THE INDUSTRY FOR THEIR OPINIONS. ►



previous page and these pages:
Stefan Antoni Olmesdahl Truen Architects – project Cove 6 – on the spectacular, exposed cliffs of Pezula Estate near Knysna takes maximum advantage of the vast amount of natural light, seasonal winds and the local fynbos vegetation of the area.

Global Perspective

Adrian Maserow of **AMA Architects** submitted a review of the World Architectural Festival in Barcelona, which he attended in late October of last year; what follows is his relevant comment. Several other SA architects attended.

'The current issue foremost in the minds of architects, designers and other authorities is ecologically-responsive architecture and planning. The ongoing environmental crisis is changing perceptions. It was noted at the WAF that, 'There is an irresponsibility in trying to build a 175-storey-high building in an energy crisis.'

'Yet architecture concentrates on what is important to people and today they are alive to a popular admiration of modern architecture. Interestingly, technology is hand in hand with capitalism and it homogenises function and therefore design. The integration of structure, fabric, memory and resources all recognise the beauty of doing a lot with less.

'The international nature of architecture is nowhere more evident than in the explosion of high-rise buildings designed by architectural practices across the globe. The World president of KPF, architect Lee Polisano, reflected on the similarities and differences of approach to creating tall buildings in very different contexts.

'Buildings are responsible for up to 50% of the carbon emissions in the world and importantly, the ongoing environmental crisis may be changing perceptions of high-rise. 'It's not about fashion, it's about survival', commented Lord Norman Foster, adding that only a firm geopolitical lead could save the planet.

'Walls of plants, photo-voltaic façades, advanced ventilation systems – and whatever one can do to collect water and direct wind – should be utilised in future and converted buildings. Ideally, buildings should run as complete ecosystems with little external energy supply; the possibility of the green skyscraper is developing fast as ecological imperatives filter into the world of international architecture.

below:
Kotlowitz & Associates

'Architects could soon realise that the aesthetic and ideological toolkit inherited from the early 20th century is no longer suitable for the 21st century with the crisis of climate change and scarce resources threatening our planet's survival. The continuing addiction to novelty, and extravagant technical gestures could in fact result in us building dinosaurs.'

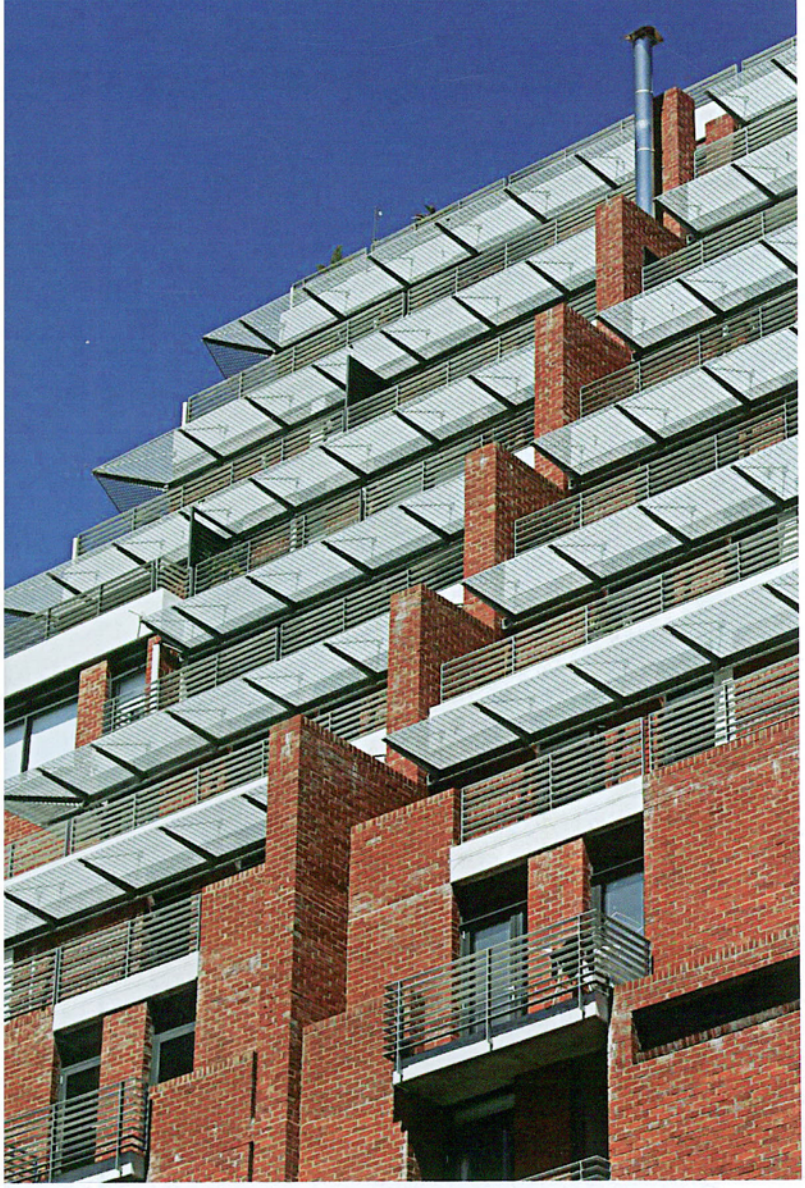
Yet how best can green technology be applied in the residential sector, how cost-effective are solar power and 'grey' water systems; and how practical is their installation?

Ben Kotlowitz of **Kotlowitz & Associates** also attended the WAF in Barcelona and noted: 'In terms of additional project costs it has recently been estimated that in order to achieve a '4 star green' rating on larger projects it will cost 2% to 3% more, a '5 star' rating 4% to 5% and a '6 star' rating 6% to 7% overall.

'Obviously, on smaller scale projects this additional 'sustainability' cost will be relatively higher; yet we should not let this deter us from the longer term view as there are clearly many benefits in taking the 'green' approach from the outset.

'The additional initial cost needs to be balanced against the energy savings that will be made over the life of the building as well as the 'embedded energy' savings created by the choice of materials utilised. A local example is a Cape-based company producing cement bricks using 96% recycled material (demolished building rubble crushed to provide the bulk of the new brick). Using this kind of brick will significantly reduce the carbon footprint of any project on which it is used.

'Both steel and glass are considered to be relatively 'green' as they are both fully recyclable materials. This is good news for modernist architects who enjoy the lightness and crispness that the considered use of these contemporary materials provides.



left:
Arthur Quinton Darryl Croome Architects

left (below):
AMA Architects (concept study)

'I believe that architects need to seriously involve themselves and become part of the solution to the energy / global warming problem. We need to convince clients that theses relatively small additional project costs must be budgeted for.'

Arthur Quinton of **Arthur Quinton Darryl Croome Architects** has a definite opinion on Green Technology vs. Intelligent Design: 'When discussing green architecture, the use of the phrase green technology is perhaps misleading. The word technology infers that the greening of a building requires technology, whereas simple good design can go a long way to achieving the same result.

'Reflective glass represents technology as one solution for heat reduction, but a smaller window with sun screening will have the same or even better greening effect, without relying on sophisticated technology as a solution. Of course technology has an important role to play in eco-friendly architecture; but technology should generally be a second stage of greening a building, the first stage being intelligent design.

'Solar heating, solar power, low-energy lighting and grey water (recycling) systems are all examples of where technology reinforces or contributes to intelligent design in the greening of a building.'

Ben Kotlowitz offers much the same rationale: 'Green technology involves the creation of sustainability – this means we should carefully assess the long term impact of each of our short term decisions. Does it make sense for instance to ship tiles from China when perfectly good tiles are made locally? Should we use more recycled materials within our structures, and to what extent do 'glass-box' houses really make sense today, given their onerous heating and cooling requirements?

'There is no doubt that answers to these and other similar questions are going to create a shift in how houses are built in the future. The key issue for architects is how to balance this ecological responsibility with the art of possibility; to still create beautifully designed houses in which green technology is carefully and responsibly integrated.'

below:
Jane Visser Architects

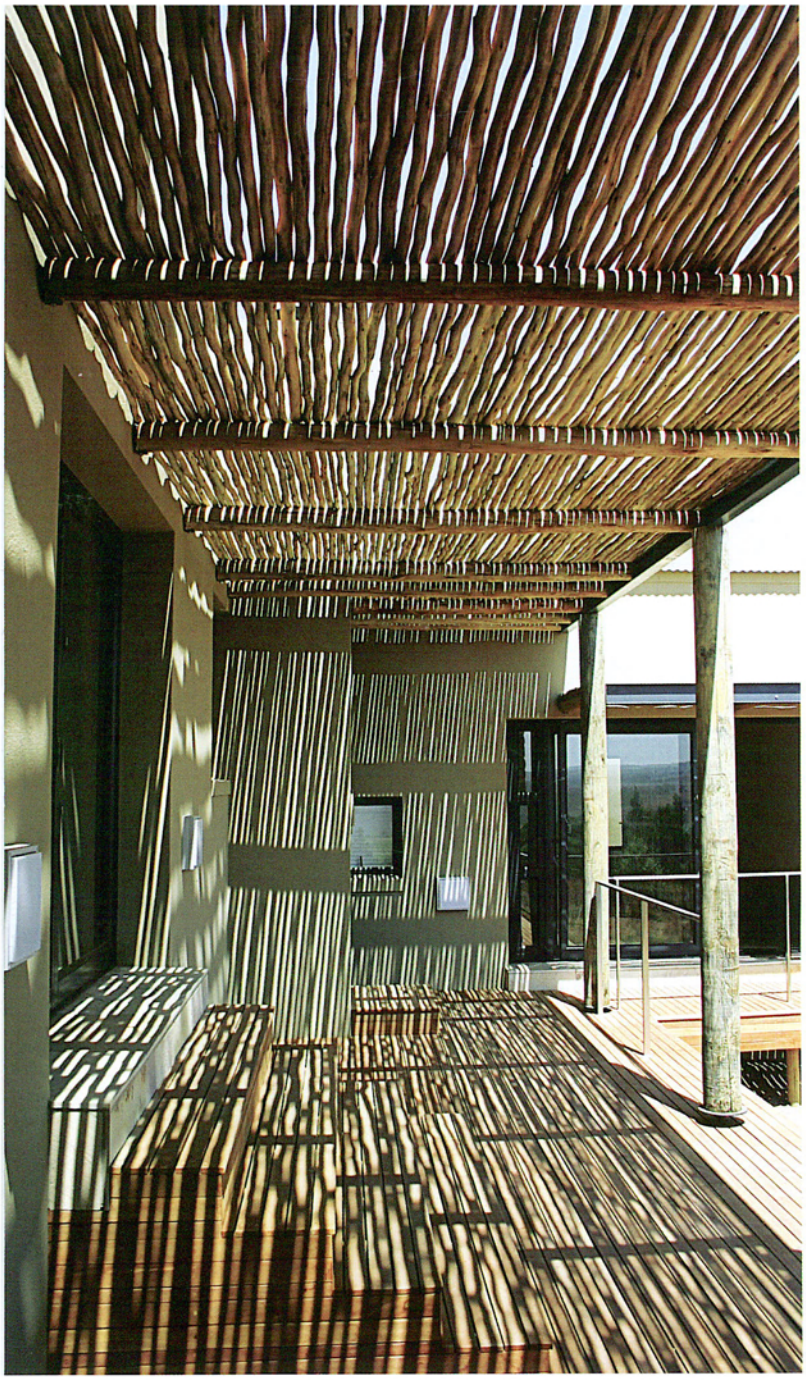
Yet how appropriately can such technology be applied to the basic structure i.e. roofing and flooring, and to the necessary systems like heating / cooling (solar or otherwise) and irrigation / water conservation.

'It begins with simple design strategies that can be easily applied says **Jane Visser** of **Jane Visser Architects**. 'Orientating the house correctly to minimise overheating or cooling, insulation, solar water heating, use of natural ventilation / light, and a grey water system. It's important to think about sustainability with regard to what materials are chosen. Life-cycle outlay must be considered i.e. short term savings vs. long term maintenance / replacement costs.

'Solar water heating is very effective and is proving to pay for itself in energy savings. Until Eskom allows feedback into the grid, converting solar power to electricity via photo-voltaic cells is not yet competitive cost-wise.

'Roofs should be insulated and solar water heaters and pool heaters should be placed here; rainwater can be collected and a roof garden can be planned where possible. Choose local materials for roofing and flooring and insulate under the floor slab to prevent loss of heat into the earth in winter, or use a suspended timber floor with a ventilated space below. Select local sustainable materials and timber from sustainable forests, carpets in wool or sisal / coir and locally sourced natural stone.'

Stefan Antoni of **SAOTA** has similar opinions: 'The aim is ►



left: *Gardiol Bergenthuin – 'Sun control / UV radiation on the Witwatersrand is of the highest in the world – making use of sunscreens (like Kool aluminium or organic timber lath structures) makes good sense. It is best to curb UV before it hits the glass. Using laminated glass products with various capacities regarding UV / IR control is sensible.'*

to create buildings which are efficient in their use of energy, water, materials and resources. Simultaneously, we should attempt to reduce their impact on the environment and human health, while not sacrificing comfort or aesthetics.

'Projects can incorporate the natural habitat, and use it to its full potential without causing damage and / or creating an unduly-sized carbon footprint. Further, we have to maintain the integrity of the natural heritage of the area; these are directions that architects and builders are closely monitoring and following. Additionally, careful attention to the cost and extra supervision that these projects require is being monitored.

'Natural building should make full use of abundant, available, renewable, re-used or recycled materials. It should incorporate products designed with maximum energy efficiency, taking the cue from nature itself.'

Architects are often asked about the cost of eco designs. Do houses that are eco- friendly take longer to build? **Arthur Quinton** feels that the debate on cost or time will soon become irrelevant as the need for eco designs becomes compulsory. He maintains that intelligent design principles remain paramount and adds: 'Even as I write, buildings are going up in the Cape Town CBD, which show an excessive use of glass, more appropriate to Europe than the severe African climate.'

Stefan Antoni: 'There is an abundance of common ►

above:
Jane Visser Architects – 'The most important factor is the correct orientation of the building. Sun control is best applied on the outside of the building. We use slatted external shutters or grilles that allow for security but also airflow. Shutters are also useful in controlling sun, if linked with excellent insulation they can reduce the need for heating / cooling.'

knowledge and taught facts, all of which are possible to include in environmentally conscious architecture. The Cape Dutch vernacular, with its overly-thick stone walls and floors, was the start of green building. Already, the knowledge that stone would absorb, retain and then slowly release heat had been put into practice.

'Along similar lines, the African people had long been building their huts with natural earth and plants. These materials provided protection from the elements, while taking very little from the environment, and producing almost no carbon footprint in the construction.'

On basic savings like irrigation and swimming pools, Gauteng-based modernist **Nico van der Meulen** of **Nico van der Meulen Architects** reflects on costings: 'Drip irrigation is more water-friendly than normal irrigation and far less water gets wasted. The use of grey water (recycled used water) is one way of saving a scarce and strategic resource, while also reducing the amount of chemicals used in sewerage facilities. New self-composting toilets are arriving on the market, making it possible to disconnect from the municipal sewer totally, and thus save a lot of water.

'The eco-friendly house is more expensive to build at this stage due to more specialised technology being used, but as it becomes more mainstream these costs will reduce. It will take slightly longer to build because it requires more ►

left:
Gardiol Bergenthuin – 'People need starter houses. Affordable, durable, and easily serviced. This seems a simple challenge but, up to now, is unrealised. What's special here is weather extremes and it means more performance required from materials and good solar orientation.'

intelligent design solutions i.e. appropriate to the country and appropriate to the location. Intelligent design is the architect's first responsibility to eco-friendly solutions.'

Nico van der Meulen: 'SA is lucky with the amount of winter sun it receives, which could be used effectively to create eco-friendly dwellings and other buildings. Year-round, this abundant solar energy could reduce solar heating dramatically in the future. Yet, in SA, we are used to cheap energy, so it may take the re-education of designers, architects, quantity surveyors and engineers to create a culture of eco-friendly design.'

Jane Visser: 'SA is special as we have an added imperative to provide employment and skills training on our building sites. I feel we should look at the sustainability of buildings in South Africa from this perspective too.

Residential buildings use a large proportion of energy in this country and I find this inspiring as it means that, if every house owner makes an effort, we can substantially effect the country's energy consumption.' ▬

these pages:
Nico van der Meulen Architects

supervision; again because a lot of the technology is still new and thus people need to be trained and supervised in the installing of systems. This adds to the cost structure, as do the more expensive materials involved.'

What of the previously mentioned ethnic evidence of successful eco-friendly residences like Cape Dutch architecture and African dwellings?

Van der Meulen adds: 'Some Cape Dutch architecture is apt: well insulated walls with high windows, set back into the walls to create sun control. Unfortunately, the use of verandahs cuts out the winter sun, making the houses cold and dark in winter, though pleasingly cool in summer. Equally notable, certain features of African architecture work well: wood and clay create good insulation, and thatch roofs allowed heat and smoke to escape, yet they are not insulated sufficiently to prevent heat loss during winter.'

We've often considered the advent of a South African style of architecture, instead of the plagiarised Tuscan / Provençal / Mediterranean renditions seen in major centres across the country. Is SA a special case in any way?

Arthur Quinton: 'Many of our buildings in South Africa are mere copies or imitations of European designs, where cold climates demand different architectural solutions. When these designs are used in South Africa – with its higher ambient temperatures and longer sun hours – unnecessary heat gains have to be dealt with. Architects (as well as their clients) should first apply ►