



Bringing Together Head, Heart and Soul – Sustainable Architecture in South Africa

Chrisna du Plessis describes how South African 'green' architecture is founded on the Ubuntu principles of interconnectedness and interdependence, in which man, and nature, and nature and community, are understood to be integral. It is an approach which has helped to make social sustainability a characteristic of contemporary architecture, whether it is applied to High Tech commercial buildings or hands-in-the-mud community architecture.



The South African view of sustainable architecture encompasses far more than the mechanics of energy efficiency and improved performance and durability. Apart from a common-sense approach to resource efficiency, it has a strong desire to encourage social harmony, as well as an emotional connection to both the land and its cultures. Rooted in an ecosystemic world-view that is the heritage of a pastoral and agriculturalist life style, sustainable architecture in South Africa tries to express a heartfelt, almost spiritual response to the African context and the need to belong in and care for a beloved country. At the same time, it is driven by the pragmatism and rational, scientific approach of the mechanistic world-view. This results in an interesting spread of work ranging from the intellectual European style 'green' architecture that strives to improve the performance of conventional construction practices, to a reinterpretation of traditional architectural forms and values that aims to create a 'house for the soul'. The case studies discussed illustrate how the approaches differ from one end of the sustainability spectrum to the other, while all trying to create an architecture that is more than the 'green materialism' of ecologically approved buildings that are still hurtful to the spirit. An architecture that is true to the roots of South Africa.

The Historical Context – Living with the Land
South African 'green' architecture is founded on the principles of interconnectedness and interdependence. These principles form the basis of the African philosophy of Ubuntu. They are also found in the work of early Afrikaner thinkers and are encapsulated in the philosophy of holism promoted by General Jan Smuts, erstwhile prime minister of South Africa and one of the founding fathers of the modern United Nations.

Both the indigenous people and those European settlers who made South Africa their heartland followed an approach to the creation of buildings that is based on the understanding that man and nature, and individual and community, are interdependent. Their architecture was simultaneously a pragmatic response to the exigencies of a survivalist life style, and a deeply spiritual response to a sense of connection with the land, with nature and its cycles, and with the community. Historically, both the indigenous and the settler homesteads were characterised by climate-conscious design, the efficient use of local materials and the use of

agglomerations of small individual buildings and delineated outdoor spaces to house the various functions of a household. This allowed for flexibility and growth in the design. The building and its environment were not seen as separate entities, but as integrated, though different, aspects of a holistic life style.

In a sense, this early architecture of grass or mud huts and 'hartebeeshuisies' can be seen as the ultimate in green architecture. Made from local, renewable resources and using communal labour, the buildings were also completely biodegradable, leaving just stone foundations that could be reused or recycled. A conspicuous characteristic of these homesteads was their self-sufficiency and the fact that every resource was used to its fullest potential.

At the beginning of the 20th century two main formal architectural traditions could be found in South Africa. The one was a direct import from Europe, with scant attention paid to the context: the Neoclassicism of Herbert Baker and the corrugated-iron and cast-iron 'kit houses' imported to house the officials of the British Empire. The other was an attempt by Afrikaner architects to find a regional architecture that married the European traditions they were taught with the traditions, climate and materials of a continent with which they had built emotional links. While not consciously 'green', this architectural movement fulfils many of the requirements of green architecture, while attempting to find an aesthetic that is culturally and contextually appropriate.

Early architects such as Gerhard Moerdyk, and artists JH Pierneef and the Preller brothers, supported an organic and emotive response to the context which drew its inspiration from both indigenous and settler traditions. Their attempts at combining indigenous spatial layouts and decorative traditions with European construction methods and building forms continues to influence architects and inspired a host of 'African' game lodges. A different approach was followed by the next generation of architects. Inspired by the spirit that drove Frank Lloyd Wright, architects such as Norman Eaton, Karel Jooste and later Barrie Biermann adapted the clean lines and economy of Modernism to local materials, techniques, skills levels and climate, to develop what was to become known as Pretoria Regionalism.

Fisher describes Pretoria Regionalism as 'reflecting a particular response to nature and the landscape through the economical use of naturally available and industrially produced materials with an empirical response to climate.' It is an architecture characterised by screens, verandas, pergolas and deep-set windows and eaves. The materials used were stock bricks, gum poles, stone and rough-cast exposed concrete, with thatched or corrugated-iron roofs. Set in lush indigenous gardens, these buildings were designed to

be a part of nature, often blurring the boundaries between inside and outside.

The political climate of the 1980s and 1990s saw a greater emphasis being placed on addressing the social inequities engendered by apartheid, and restoring the social fabric of the country. The work of community architects like Ettienne Bruwer, Heinrich Kammeyer, Peter Rich and Carin Smuts primarily tried to achieve harmony within the community. The 'green' features they introduced were a pragmatic, common-sense solution to improving levels of comfort. Furthermore, the poverty of their clients prompted an architecture of sufficiency – not using more materials than is absolutely necessary and designing flexible, multipurpose spaces with robust detailing adapted to local skills levels. This was combined with the use of local labour, often trained during the construction process, and a design process that involved the community and resulted in appropriate solutions to their real needs.

The emotional response to the land and its people was replaced by a rational approach to the issues of resource efficiency, which uses passive solar design and high-tech solutions to reduce energy use and manage waste and water.

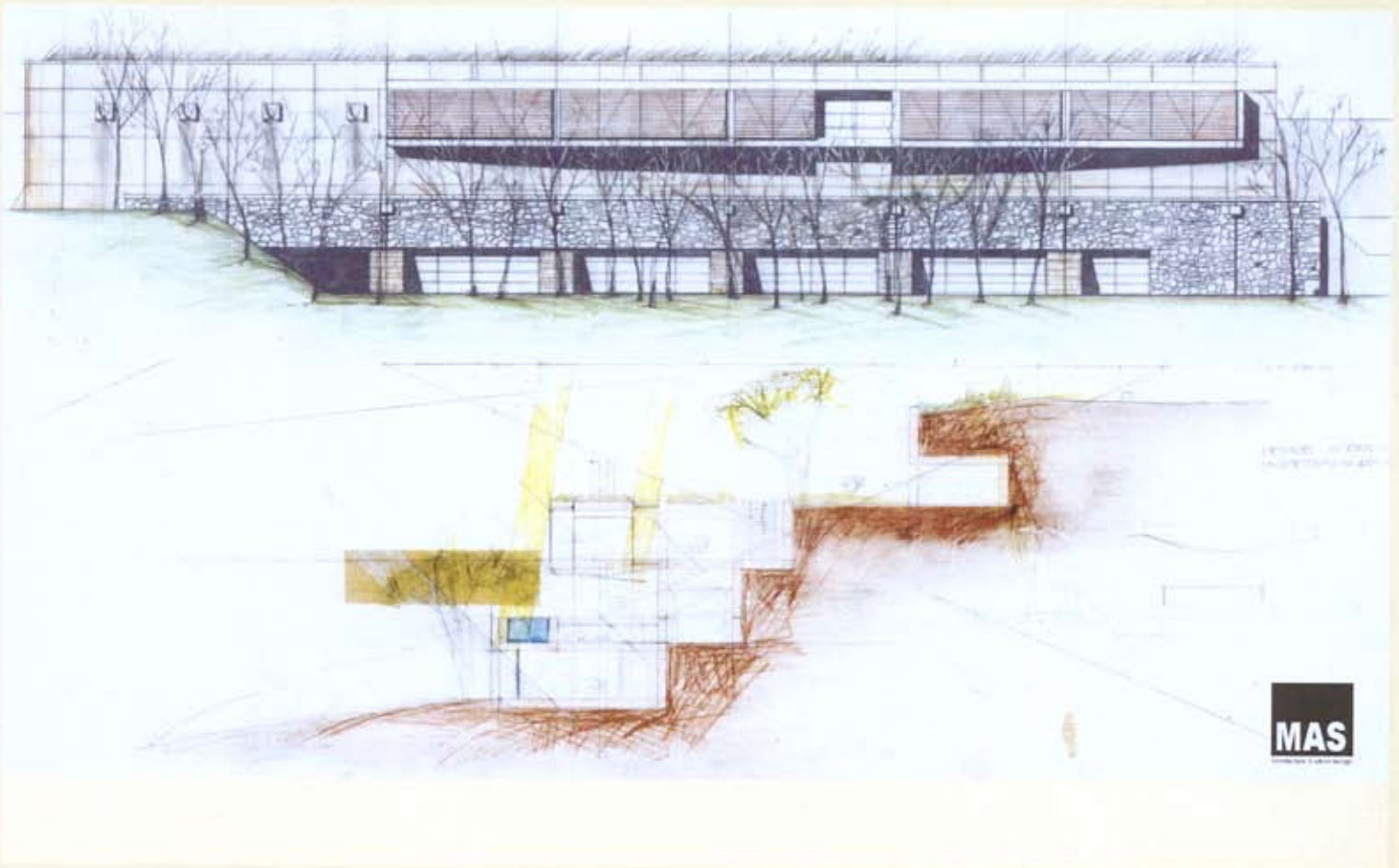
Come 1994 and South Africa's return to the international fold, this rich history of sustainable architecture was sidelined as politically incorrect (linked to the Afrikaner regime) and too technologically backward for a country that aims to be the African superpower. The emotional response to the land and its people was replaced by a rational approach to the issues of resource efficiency, which uses passive solar design and high-tech solutions to reduce energy use and manage waste and water, while continuing to

use conventional construction methods and materials such as steel and concrete. This approach was mainly imported by the multinational construction and design companies who were entering South Africa and is based on the green architecture movement of the industrialised world.

Despite practices such as Holm, Jordaan, Holm pioneering the rational approach as early as 1985 with the headquarters of the Building Industry Federation of South Africa, it was slow to take off. It is only in the past three years that pressure from international clients, and initiatives such as the Green Buildings for Africa programme driven by the CSIR, that we have begun to see results in the form of actual buildings. What adds a South African flavour to the approach is the incorporation of social sustainability into the construction process. As empowerment and job creation are two cornerstone requirements of government procurement policies, companies are forced to make social sustainability part of their business. This can take the form of joint ventures with previously disadvantaged companies, the training of local labourers in new skills that enable them to set up their own businesses, or the use of labour-intensive construction methods and locally manufactured materials.

This rational and pragmatic approach is followed not only by corporate clients but also by those working towards improvements in housing. As early as 1951, the National Building Research Institute was undertaking research on passive solar design in low-cost housing. This work was largely forgotten in the political turmoil of the 1970s and 1980s and only resurfaced when the Integrated Departmental Task Team on Environmentally Sound Low-cost Housing was formed to develop a set of guidelines for developers to follow. NGO-driven pilot projects such as Kutlwanong, a community-driven housing project near Kimberley, and the All Africa Games Village in Johannesburg illustrate the benefits of passive solar design principles, but the mainstream uptake has been minimal. This is mainly because the housing subsidy is not large enough to pay for simple energy-efficient features.

Another major obstacle towards more sustainable mass housing is the rejection of alternative technologies despite major cost savings to the home owner. For example, while community centres built of earth such as the Alliance Française Centre (Mitchell's Plain, Cape Town) are readily accepted, home owners are reluctant to accept earth construction as a viable alternative to the more conventional cement-block construction used in low-cost housing. There is also a low level of awareness of the benefits of energy- and water-efficiency measures and, as has happened in the All Africa Games Village, residents remove many of these features to install more conventional fixtures.



The Case Studies

Three small practices have been selected and their approaches range from the High Tech commercial to hands-in-the-mud community architecture. Together they epitomise the combination of head, heart and soul found in South African sustainable architecture.

An African House for the 21st Century – MAS Architects

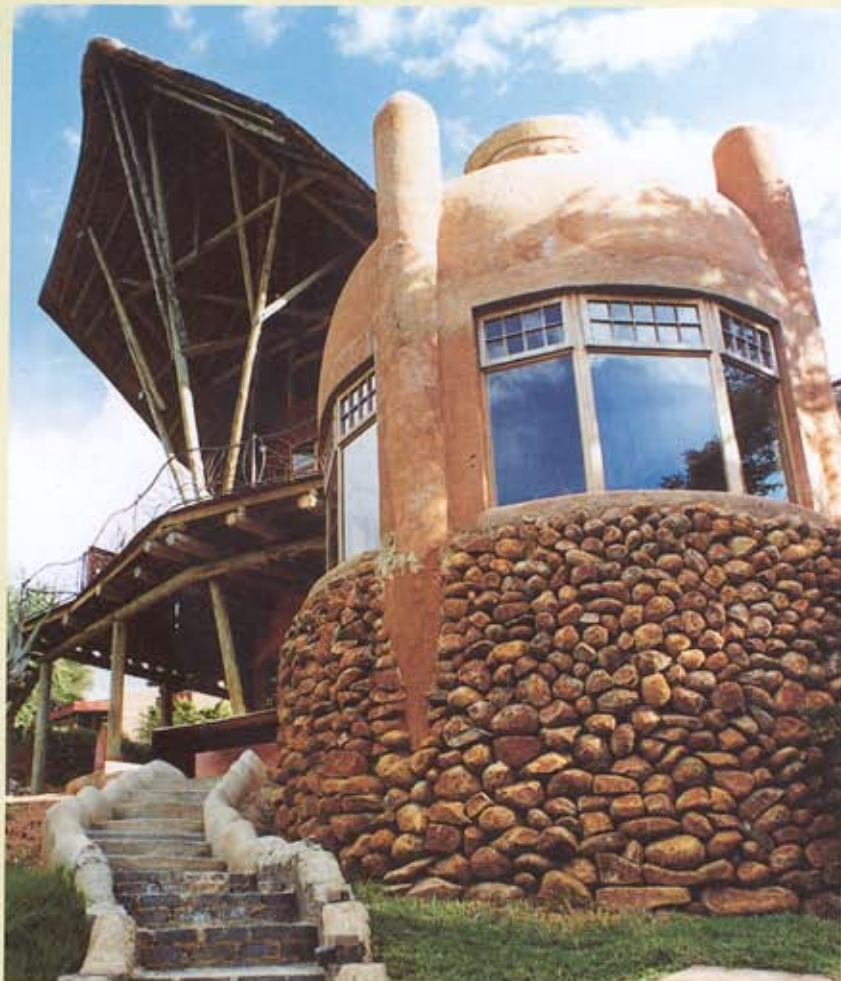
MAS Architects is a small architectural and urban design practice that serves mainly corporate clients. The vision of the practice is to achieve synergy between technology and nature while providing desirable, healthy spaces. This is backed by a strong empowerment focus in their procurement and employee-development policies.

In 1998 the practice was approached by the owner of Westcliffe Estate in Johannesburg with the brief to design a 21st-century African house. The design team and the client concluded that the architecture of this century would be epitomised by the coming together of information technology and environmental responsibility in buildings designed for people within their local context. To achieve this synergy, the emphasis in the design of this family house was placed on resource management. The north orientation of the building, with large shading devices and dark wood shutters, reduces heating and cooling requirements. The stone wall that backs the house acts as a heat battery and also stimulates

the convection currents that draw in cool air over the swimming pool, thus cooling the entire house. Natural gas meets all the heating requirements with excess heat used to warm the swimming pool. To manage energy use efficiently all lights, appliances, heating and security features are controlled from centrally located touch screens linked to a central computerised system. In addition to energy conservation, rainwater is captured in enormous tanks in the basement and is used to irrigate the garden and flush the toilets. Excess water is led through agricultural drains, lessening the need for an elaborate storm-water installation and replenishing the ground-water system.

Stone from the site is used for cladding and to fill the gabion baskets covering the front facade, and material reclaimed from other site excavations was used to build the retaining walls. Most of the wood in the house is reclaimed from decommissioned African mines. The interior was designed to be very flexible, with most of the partitioning reconfigurable. As the family owns an extensive art collection which is currently housed all over the world, the house was also designed to eventually become a venue for a permanent exhibition of the collection, thus extending its usable life span. The house is also constructed according to ISO 14000 principles of environmental management.

The trickier question was what would make the house African. As it is built for an extended family, it was seen as a village with the different functions accommodated in separate wings linked by communal spaces. In traditional villages, the tree and the river are the key places of social interaction, and therefore the central meeting space was envisioned as being under the village thorn tree, with the river flowing in front.



Situated on the steep slopes of one of old Johannesburg's hills, the site is visible from miles away, and the client did not want to contribute to the existing visual pollution. The house was therefore designed to eventually fade into the natural features of the hill. Its concrete structure is clad in stone from the site so that it resembles a continuation of the cliff face, with the 'tree room' itself reading as a cave in the mountainside. The central cantilevered roof is covered in oxidised copper and the other roofs are planted with indigenous vegetation. The entire site is rehabilitated and planted with indigenous vegetation to restore the degradation caused by the building process.

Westcliffe Estate is a good example of commercial 'green' architecture. It uses conventional concrete and steel construction, but introduces sustainability through the energy and water systems, recycled stone from the site, indigenous landscaping, natural ventilation and passive thermal design.

Excavating Forgotten Knowledge – Archeo-Architects

Director Francois Lötter of Archeo-Architects describes the practice's work as an attempt at excavating the lost common-sense knowledge of both physical and spiritually sustainable living, while developing a regional aesthetic that is based on the traditional shapes and materials of indigenous architecture.

House Mosedi in Johannesburg was built for a client who wanted a 'spiritual' house that would connect him to his African roots while living lightly on the land. The process of designing and building was unexpectedly emotional and turned into a spiritual journey for both architect and client, during which they had to rethink many of their preconceptions about both interpersonal relationships and the relationship between man and nature and man and the cosmos. Many of the ecologically friendly systems that were designed for the house were rejected by the city council and, in the end, the 'green' part of the building was limited to the materials used. Thatch, gum poles and rock from the site were used together with construction materials rescued from demolition sites.

The ideas developed during the design of House Mosedi were taken further in the next project. The owner's house of the Thaba Ya Batswana guesthouse complex in the Magalies mountains west of Johannesburg is an emotive response to the Shona ruins found on site and the grand vistas of the landscape. Built on a stone plinth, the primary form-giver of the homestead is a combination of circular and rectangular shapes used by the Shona people. Windows are deep-set or covered by large roof overhangs. The entire house is run on solar power, with a backup generator for the few days a year when the sun is not enough. Grey water and black water are separated, filtered and recycled on site, while large rainwater storage tanks are built out of local stone. No formal garden will be planted and the indigenous vegetation disturbed by construction is rehabilitated.

Together the two houses illustrate the difficult juggling act of reconciling conventional construction



Above left: Greenhaus Architects, gateway to the Uluntu Centre, Cape Town, 1991. Situated in the township of Guguletu, this community centre is the result of a long social-design process.

Above right: Greenhaus Architects, Place del Ange, Kempton Park, 1999. Located near Johannesburg airport, this private 'guest farm' for foreign visitors is linked to a game lodge/resort group.

Note
1. R Fisher, 'A South African Style-line' in Architecture 2000. A Review of South African Architecture, Picasso Headline (Cape Town), 2000, p. 50.

practice, as accepted by councils, contractors and clients, with a more environmentally friendly and romantic approach to architecture.

Building with Soul – Greenhaus Architects
Over the years Etienne Bruwer has acquired a reputation as an architect who builds with soul. He describes his work as an attempt to reconcile the formative principles of metamorphosis and sacred geometries with the 'green' agenda in a buoyant, dynamic way. Working with natural materials such as cob and strawbale, and following an aesthetic directed by anthroposophical principles, his buildings are organic yet practical, sensuous yet functional.

Working in community architecture, Etienne's playful workshops encourage communities to work together. In that way, the process of building also helps to restore balance and harmony within them. A good example of his community-orientated, hands-on yet spiritual, approach is the Uluntu Centre in Guguletu, Cape Town. In 1990 the Urban Foundation approached the architects (Bruwer and Johnson) because they were anxious to combat the vandalism and resentment that the community was targeting at the 'industrial sheds' that had previously been built. Meetings with local people went on for nine months before the community decided what their space requirement priorities were. The designs were then developed with the adults through clay workshops. This resulted in a building that



consists of 'indoor' spaces set in a matrix of conversational 'outdoor' spaces formed by the undercover circulation spaces. Low budgets called for innovation – carved wooden salad bowls became light fittings and the architect himself stained the glass.

This idea of the building as a narrative of indoor and outdoor spaces, enabling conversations between humans and nature, continues in the practice's residential architecture. A house in Johannesburg is described as negotiating archetypal experiences – 'in a boat', 'along the cliff', 'down the hill', 'the spirit that is behind the wall.' There are neither courtyards nor passages, only openings that breathe into opened inside spaces where man and the elements, fauna and flora, can mingle 'intimately and rhythmically'.

The 'green' features are woven without thought into the spiritual being of all Bruwer's buildings. They are not add-ons but an intrinsic feature of the poetry in the architecture; spontaneous inventions that run as a theme through the building.

In Conclusion

In the past 50 years political agendas and economic policies have done much to destroy the traditions of interconnectedness and interdependence with nature found in South African architecture. Elements of it remain, however, in the work of a few inspired idealists, whether they approach it from the head, the heart or the soul. What is required now is a new design paradigm, where environmentally friendly features are included not because of profit motives or regulations, but because they form an intrinsic part of the building's essential harmony. Δ