



# Innovative construction technique used at eco-village

The idea of using the sweat equity (labour) of the end-user of the building to reduce costs is not new. It is generally recognised that owner building, even when using conventional materials, can save up to 50% of the building costs. The degree to which savings can be achieved is dependent on the skill of the owner-builder, and / or the degree of skill needed for particular building materials or technique.

Choosing materials and techniques particularly suited to the owner-builder will also increase the savings of construction cost. The savings can also be increased by careful selection of low-cost materials, which can be made or collected by the owner-builder. While this building system is ideally suited to the owner-builder, it is equally well suited to support the develop-

ment of small and micro-enterprises.

The TBS is a flexible, owner-built, low-cost, high-quality housing system. It avoids the shortcomings of current low-cost housing construction in South Africa, while addressing environmental and resource problems that are not usually considered in South African low-cost housing.

It combines the principles of sustainable

building systems with natural waste treatment and the

perma-culture approach for designing food self-reliance. This includes using modern techniques of unburned mud-brick, passive solar design, appropriate technologies of rain-water collection, compost toilets, grey-water irrigation and solar water heating.

Sub-standard housing at the Tlholego Eco-Village in the North West Province has been replaced by constructing four high-quality houses using the TBS, and another three TBS houses at other locations in South Africa.

TBS houses perform to modern standards and use natural materials to minimise

damage to the environment. Although this system was conceived as a solution to the low-end of the housing market, it is in fact applicable to all sections of the housing market. It is also flexible enough to accommodate conventional building materials.

The TBS system was developed in 1996 with the developing the first phase of the TBS. At this time, two prototype buildings were constructed. Prototype 1 was completely finished and consisted of a 45 m<sup>2</sup> family house.

Prototype 2, a larger 65 m<sup>2</sup> unit was also completed to roof level during this period. In 1998, the developer of the system returned to Tlholego to facilitate further development and training. A 28m<sup>2</sup> prototype 3 unit and a second to roof level were completed.

One year later, the building team plus two interns from the United States spent two months finishing the second Prototype 3 unit, and installed solar hot water, a compost toilet, connected shade and rain water collection to the building, and completed the interior details. This model provides an opportunity for all people to experience first-hand the comfort, energy efficiency and value for money that this technology provides to this day.

In February 2000, the village model was chosen by the National Department of Housing (DOH) as the most appropriate model to represent South Africa, at the Africa 'Solutions Towards Sustainable Development' conference held at Council for Scientific and Industrial Research (CSIR) in March 2000. This conference was in preparation for the 'Global Urban 21 Conference' held in Berlin, Germany in July. A scale model and multi-media presentation of the village was commissioned by the DOH for this occasion.

One of the important accomplishments thus far has been the sustained transfer of skills over the past five years that Tlholego residents have received in this innovative building technology. Residents have had the opportunity to live with this technology for an extended period of time and test it for meeting their expectations for a better quality of life. The TBS has stood up well to these expectations and Tlholego is now proud of having established the first competent building team in Southern Africa, capable of spreading the TBS within the broader community.

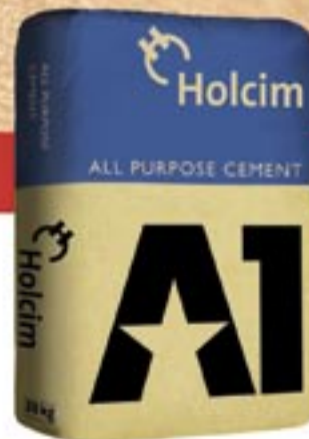
• Source: *The Tlholego Eco-Village*

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## A stylish and efficient answer to 'ready living'

Zenkaya is a hassle-free way to create extra living space on a getaway property or in your backyard. This sophisticated ready-made living structure, contemporary in design, is solid yet light, comfortable and safe.

Constructed from high-tech materials, this pre-fabricated structure was made popular by design magazines like Dwell and Wallpaper. A first in South Africa, Zenkaya is a loft-type-unit with a deck featuring glass sliding doors, designer kitchen and bathroom and other luxury amenities.

Celebrating the great South African outdoors, Zenkaya is set to be the ultimate experience in affordable luxury. It is the ideal solution when expanded living space is what you are after and would prefer not to endure another round of the intrusion, empty-promises and noise of builders. The unit is ideal as a home office, studio, holiday home or extra room. The carefully considered designs of Zenkaya living units make construction user-friendly: living units are delivered inclusive of all finishes.

Presenting new possibilities for construction of homes, Zenkaya gives buyers choice in both design and quality. Zenkaya is an innovative concept in living that strikes the welcome and pleasant balance between functionality and affordable clean-lined design.

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The units are easily transported from the manufacturer to site.



The interior floor finishes are made from hardwood from Ply-Pak and the living area features a freestanding fireplace. This photograph is taken through a floor-to-ceiling window.

## A stylish and efficient answer to 'ready living'

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Credit for Zenkaya's design goes to Fablife, an architectural design company which blends inspiration and experience from Africa, New York, France and Japan. Through innovative and disciplined design, they bring the beauty of the African outdoors in; Zenkaya achieves this by being the canvas, magnifying the on-the-stoop lifestyle and viewpoint from where the painting (surrounding natural space) can be most enjoyed.

The Zenkaya living units, aimed primarily at the second-home market and tourism industries, can be customised to suit individual budgets and tastes. Once you've chosen your unit size, you can custom-select finishes for walls, floors, ceiling, windows, kitchen elements, appliances, bathroom fittings, switches, decking and your heating system.

Spacially, the units are open-plan design, constructed of a sturdy metal frame with floor to ceiling glass windows and sliding doors (louvre windows or shutters provide an extra layer of security where needed) for harmonious indoor-outdoor living.

Constructed around a steel frame, the exterior walls and roof are made of highly insulated polystyrene and chromadek, the

floor structure, ceiling and interior wall finishes are of wooden oriented strand board (OSB) from Sonae Novoboard.

The interior floor finishes are made from hardwood from Ply-Pak, the decking is made of wood composite from Diamond Deck and the imported sliding doors are from Alugro and double-glazing from Smartglass. The stylish, compact kitchen is from Rossi Kitchens, the bathroom sanitary ware and taps are from Water Comfort, the pebble finishes in the shower are from Island Stone and the slick, free-standing fireplace is from Jetmaster. The brushed stainless steel switches are from Lumen 8 and the laser cut stainless steel sign is from Laser Print.

The simplest living unit is the Zenkaya Studio (3,6 m x 6 m) with next sizes being the Zenkaya Loft (3,6 m x 9 m) and the Zenkaya 1-bedroom (3,6 m x 12 m); all come with a bathroom, kitchenette, open-plan living-dining space. The largest in the product range is the Zenkaya 2-bedroom, which has the added aesthetic of an extended wooden-decked stoep. A standard deck extension (3,6 m x 3 m) is also available for the studio, loft or 1-bedroom. Other designs and ranges will be available in the near future.



Western Cape Housing Minister, Marius Fransman, tries his hand at laying a few dry-stack concrete blocks.

## Bonded dry-stack precision blocks for self-help projects

Dry-stack construction, a system that uses high precision concrete blocks and replaces conventional mortar with a thin glue-like bonding agent, Block-Grip, has the potential to ease South Africa's housing shortage. The reason is quite simple, modular dry-stack masonry allows unskilled people with minimal training to build structurally sound and weatherproof walls for housing, schools and community centres.

Based on a French building model, South Africa's dry-stacking initiative was pioneered by Concrete Manufacturers Association (CMA) member, Columbia DBL, and embraced by a dedicated German civil engineer with a social conscience.

Elise Elsing has initiated several community schooling projects in the Western Cape, the first, a community centre for 'Women for Peace' was built in Mfuleni, Blue Downs, in 1998. Subsequent projects include a 188 m<sup>2</sup> child welfare centre in Khayalitsha and a 400 m<sup>2</sup> pre-school at Lawandle near Somerset West. A second pre-school project of some 450 m<sup>2</sup> is currently under construction in Khayalitsha.

These projects were paid for with funds raised by Elsing through overseas donations. Prior to her involvement in community work, she was the project co-ordinator and quality assurance supervisor for the construction of the Cape Technikon campus.

Each dry-stack community project was built using local unskilled labour, trained and supervised by Elsing. A huge plus for the system is that a qualified person need only supervise the laying of the first course. Thereafter local people can take over because once the first course is laid correctly, dry-stack walls cannot line up in any way other than straight.

As in conventional concrete block masonry units, dry-stack blocks are cast in concrete with cavities. However, dry-stack blocks are cast to within accuracy levels of 1 mm and have a very precise interlocking mechanism. Columbia DBL uses steel pallets to produce the required precision on a consistent basis.

Precision casting and the interlocking mechanism ensure that once the walls are built they are straight. As they are snug fitting, Block-Grip rather than cement mortar, is used as a binding agent. Dry-stack blocks comprise interlocking 200 mm x 400 mm x 200 mm (or 150mm) hollow core concrete blocks with a very high MPa. This makes them suitable for

multi-storey buildings as well.

CMA Western Cape regional representative, Guenter Koch, says cost wise, dry-stacking is on a par with conventional building practice, however, the superior quality and self-help aspects mean that it can accelerate housing delivery.

Elsing and a four-man team recently completed a 78 m<sup>2</sup> three bedroom house for a foster mother within three working weeks in Khayalitsha. Cape Housing Minister, Marius Fransman, visited the site as well as the latest community centre project in April. He and Elsing are investigating the possibilities of using the dry-stack / Skim-Plaster / Glutone system on a wider basis for self-help housing.

Besides the community centres described above dry-stacking has been successfully deployed on several kilometres of engineered boundary walling in the Western Cape.



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