

Eco-architecture is gathering up a force of environmental warriors – from small clients to big businesses. Award-winning architect Andy Horn is in the front line

CLOCKWISE, FROM TOP LEFT The Nieuwoudtville camp site gatehouse under construction – Eco Design Architects won an award for their eco-friendly building methods and systems used for the camp-site buildings; succulents were lifted from the construction site and planted on the roofs to retain the habitat and provide natural insulation; the award-winning Twinstreams Environmental Education Centre in Mtunzini has an infrastructure of efficient and natural energy systems designed by Eco Design Architects. This project trained local community members as eco-builders and used sandbags and locally harvested timber poles; straw is used as a construction material; clay-plastered straw-bale wall

In 2005, architect Andy Horn's company Eco Design Architects won a Silver Holcim Award for Sustainable Construction in Africa and the Middle East, placing the small Cape Town-based architectural firm in the top 15 out of more than 3 000 entries from 118 countries.

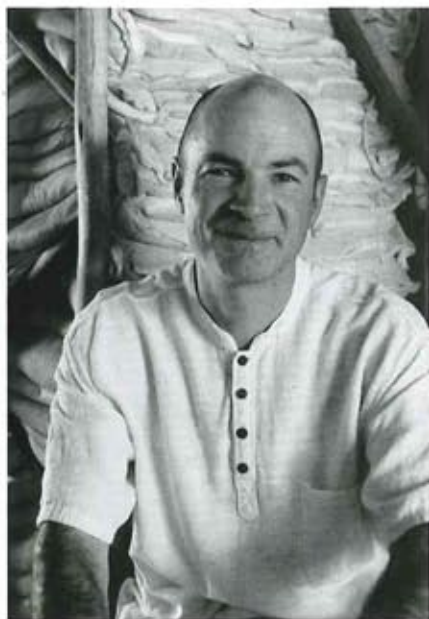
It came hot on the heels of a Sustainable Building Best Practice Award for Residential Projects in the Africa Region in 2004. These achievements boil down to a respectful nod from the profession for over 10 years of formal work in ecological design.

Before Andy qualified he had all the building blocks – a passion for recycled materials such as thatch, compressed earth, stone and clay, and a strong conviction that we should be building with natural, nontoxic materials. 'Growing up in Swaziland, I was very aware of how indigenous structures blended beautifully with the landscape. Across the border in South Africa it was a different story.'

But it's not easy being something of a purist and single-minded about sticking to principles. His university thesis – based on a real eco-sensitive project that was being undertaken by a French company for the Alliance Française in Cape Town's Mitchell's Plain – was almost derailed when his professor declared the site for the community centre Andy had designed inappropriate. 'I shelved a lot of my eco ideas that year and compromised, but when I started practising, it was different.'

Three years later Andy got the opportunity to put his theoretical design into practice as project architect for the construction of the same community centre – on a different site. What was significant about the project was the use of compressed earth bricks made on location. Compressed hydraulically, the bricks are strong and durable. Used widely in the rest of Africa and parts of Europe, Russia and Australia, it was a first for Cape Town in 1996. It should have been the start of an era of ecologically savvy building.

And therein lies the rub. Shouldn't a building method that insulates well, is not transported at high cost by road (resulting in no carbon trail) and is not wrapped in plastic for delivery, be the answer to housing ills? Further, the cost of the bricks weighs in favour of manpower not manufacturing, effectively addressing two issues: ecology and job creation. The answer is an unfortunate catch-22 in local building regulations that bring this kind of construction to a standstill. It doesn't help if the client is determined to uphold the



FURTHER READING & RESEARCH

• *Silent Spring* by Rachel Carson (Penguin Books) R183 on

www.kalahari.net. The book was first published in 1962 and was an instant bestseller

• Visit www.greenhouse.org.za – an excellent local resource for finding out more about green living and development

principles of green architecture – the current small print makes this approach unsustainable. Andy's first commission in his independent practice came from actress Sandra Prinsloo, who asked him to build an old 'langhuis' in Elands Bay using the straw-bale method. This method took off in Nebraska in the United States over a century ago, when raw materials had to be sourced on site. 'Someone stumbled upon these houses in the 1970s and they were still in good condition,' says Andy. 'Straw is an amazing material. It's an incredible insulator – it outclasses brick in terms of its acoustic and thermal properties. You have to watch moisture levels at the base, but as long as you give the house good boots (foundations) and a hat (roof), it's perfect. The lime and earth plaster used to cover the straw allows the house to breathe.'

Essentially it's about using waste material – the straw, a by-product of grain production – as a construction material, instead of potentially burning it and polluting the environment. The problem is that the method needs specialised contractors and unless the demand increases, it's easier to build with traditional materials in the way it's always been done.

But with the world slowly awakening to the nightmare of global warming and squandering of energy resources, governments elsewhere are wising up to communities who want to go the off-grid, eco-friendly routes. Essentially this means a community that has an independent energy supply – solar or otherwise – as well as a rainwater recycling system and biodigesters for their sewerage. Methane gas generated by the sewerage can be used for cooking and recycled water purified through reeds and gravel is, ultimately, drinkable.

Andy is all for it. 'My sense is that we'll all have to go this way eventually. With power cuts and limited resources, it's the only answer. I've stuck it out for nine years now. I started with one student to help, now I have five or six, so the demand is growing. What I'd really like to do is shepherd a big project through from concept to completion. Some of the most exciting finishing and fine-tuning, especially with the palette of materials and light available, comes in the last quarter of the building process, and that's when architects often play a lesser role.'

Already Andy is being asked to consult to a wide range of clients including the Department of Water Affairs, Eskom, Conservation International SA, South African Heritage Resource Agency, the City of Cape Town, Mondi Timbers and the South African National Parks Board.

Whether it's from the top down or the bottom up, it seems that 'green' has gone mainstream – just in time. The test will be in future property sales pitches. When real-estate agents cotton on to the financial upside of green, we'll be seeing 'ideal eco-home' join the flowery sales text, along with 'exceptional views, designer fittings and close to schools'. ■

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ANDY'S ECO-BUILDING CHECKLIST:

1. When using timber in your home, treat it with nontoxic boron: regular treatments such as creosote, TBTO, PCP and CCA contain a cocktail of toxins, carcinogens and VOCs (volatile organic chemicals) that are emitted as gases at room temperature.
2. Tongue-and-groove ceiling boards come pre-treated with PCP or PBTO – both of which are lethal. Request untreated timber and treat it yourself with boron, available from EnviroTouch. Visit www.envirotouch.co.za.
3. Avoid particle boards like chipboard or superwood as they're full of gas-emitting formaldehyde. Ask for a material safety data sheet to check what compounds the manufacturer has used, or opt for imported eco-friendly options. Visit www.hemporium.co.za.
4. Go for natural light where possible. Your pineal gland needs at least 30 minutes of natural light per day to function efficiently and keep your spirits up.
5. Use nontoxic paint. Visit Breathecoat (www.breathecoat.co.za), The Original Milk Paint Co. (www.milkpaint.co.za) and Ancient Rock (www.biocover.co.za).
6. Buy filters for your down pipes and use the water for your pool. For water-recycling options, visit www.freewater.co.za.
7. Install a dual-flush toilet or retro-fit your existing toilet with a multi-flushing device. Visit www.water-rhapsody.co.za.
8. Forget chlorine pools – one step beyond saline is E-Clear, which uses electronic oxidation to keep water in pristine condition.
9. Recycle grey water for irrigation – used bath and laundry water shouldn't be wasted.
10. Use coir or sisal carpets, but make sure you check the backing as rubberised sealers can be toxic.
11. Don't use solvent-carrying glues, resins and epoxies. EnviroTouch products are safe. Try their ProNature Rock (a natural sealant for tiles, stone, masonry and concrete), as well as pure plant turpentine and a whole range of eco-friendly timber treatment products. Visit www.envirotouch.com.
12. Cluster your low-voltage lighting. Low-watt globes give good light while using less energy.
13. Install solar water-heaters when your old geyser goes, or at least ensure that your new geyser will be compatible with solar pipes at a later stage. In the meantime, insulate for maximum heat retention and fit a timer switch to operate the geyser during peak times only.
14. Insulate! You can insulate your pipes to minimise heat loss. If you're installing new pipes, use pre-insulated Wirsbo flexible pipes – they're free of lead, copper and other contaminants.
15. Insulate the roof with ThermGuard, an efficient insulator with a 70-percent component of recycled newspaper, or try Isotherm, a nontoxic recycled plastic.
16. If your house has lots of glass make sure overhangs shade it, but still allow winter sun to warm the indoor space.
17. Triple glazing is the new rage, especially in colder climates where the air trapped between the glass acts as a natural insulator.
18. Use underfloor solar heating.
19. Solar power doesn't generate enough energy to cook with: choose a gas oven rather than an electric oven.
20. Use local material to decrease carbon-dioxide emissions generated on the delivery journey.