

### Caravan site upgrade, Nieuwoudtville, South Africa

#### Project data

Type of project Public utilities  
Start of construction July 2005

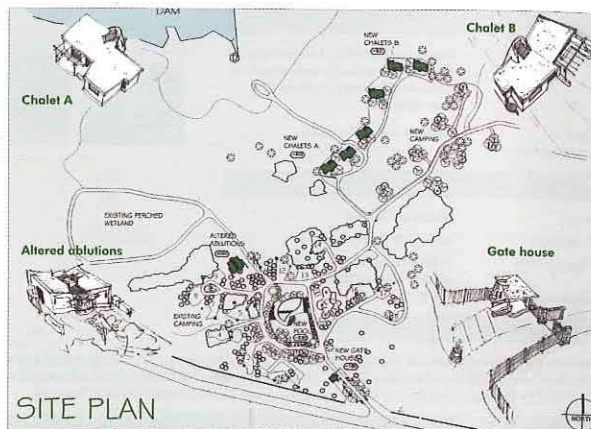
#### Author

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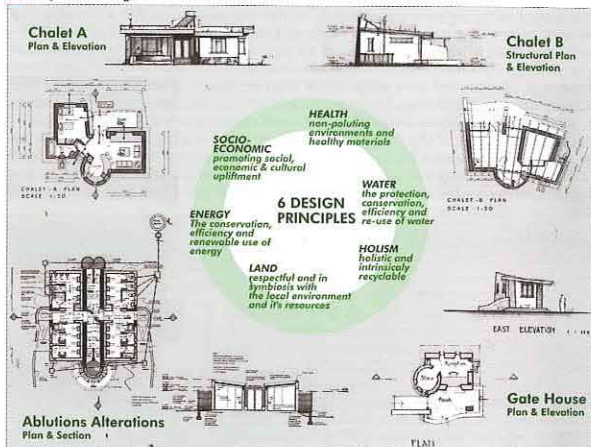
City, Country Cape Town, Western Cape, South Africa

#### Further authors

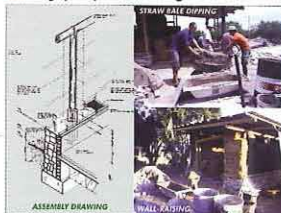
Flavio Tedeschi, Anne Marie Moore  
Evacuated Tube drawing of slide 8 courtesy APRICUS SOLAR



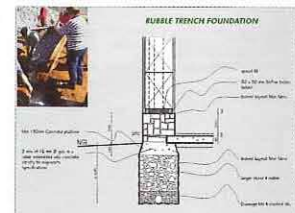
▲ Site plan with design sketches



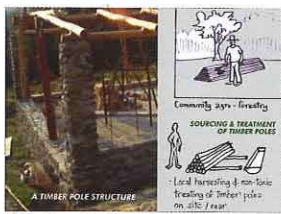
▲ Design principles and drawings



▲ Straw bale construction



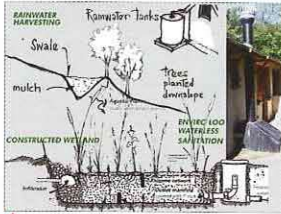
▲ Rubble trench foundation



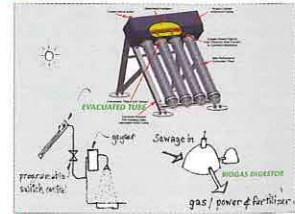
▲ Treating and cutting create jobs



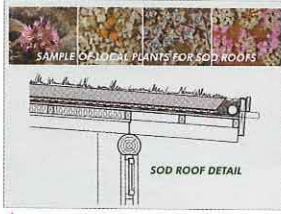
▲ Community involvement



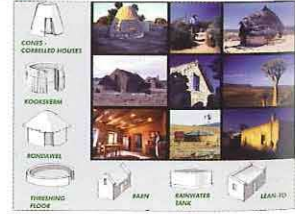
▲ Water conservation



▲ Renewable energy



▲ Planted roof construction



▲ Context and building typology

#### Comment of the Holcim Awards 2005 jury for Africa Middle East

The work is highly commended for its systematic approach to addressing the target issues in a non-invasive manner that respects the context in which it is situated. In order to ensure the requisite natural conservation standards necessary for such a site, the authors apply a well-considered balance between a selection of locally available materials and construction technology - with straw bale walls, timber structure and sod-roof as key elements - and new technologies that optimise renewable energy - vacuum-tube collectors for solar water heating as well as PV for low-level appliances and lighting. Equally significant is the use of composting toilets rather than water-based sewage, thereby providing an opportunity to recycle greywater following its preliminary treatment through a constructed wetland. The possibility to transfer these principles and technologies is highlighted by the fact that critical applications have already been proven effective in a project implemented elsewhere by the design team. Also important is that the aesthetically subtle and refined solution sponsors broad-based stakeholder participation in the conservation of "biodiversity hotspots," thereby fostering committed involvement from a wide sector of the community to plan their mutual future.

#### Project description (by author)

**Location:** Near the edge of the escarpment in the Northern Cape. The area is a biodiversity hotspot and is known as the bulb capital of the world. The dry highveld climate is exposed to extremes of weather.

**Background:** In March 2004, Conservation International organised a week long community participation "Banking on Bulbs - design charette" which set out to conserve biodiversity through the holistic development of tourism on the Bokkeveld Plateau. This resulted in a regional development strategy. A further outcome was to halt the ongoing municipal caravan site upgrade so as to realign it with the broader objectives of the charette. Community task teams were set up to carry forward specific objectives of the strategy and Eco design was appointed to the project.

**Brief:** The architectural brief included the development of a gatehouse, 6 chalets and renovations to the existing ablation block. The aim was to create an environmental showcase in concert with the charette while increasing the resort's marketability.

**Design strategy:** The design strategy makes use of locally available natural materials to minimise environmental impacts while maximising community involvement and local job creation. By utilising a range of renewable energy and ecological sanitation systems, running costs can be minimised. Furthermore this helps to safeguard environmental sustainability and increases the site's marketability.

**Gate house and chalets:** These buildings are to be built using an innovative straw bale building technique recently tested by Eco Design on another project. This involves first dipping straw bales in a clay slip prior to their being stacked while still moist between a timber pole and stone structure. The walls with the planted roofs help create incredibly thermally efficient structures, particularly suited to the local climate. The chalets are to be serviced by dry composting toilets and their greywater is to be recycled to irrigate the landscape. Close coupled solar water heaters located above the stone cones showcase environment friendly domestic water heating. The L-shaped plan of chalet A with views of the dam, helps shade the verandah from the hot westerly sun.

**Ablution alterations:** Alterations to existing ablutions involved the safe removal of hazardous asbestos roofs, turning the centre space into change rooms under an open pergola structure so as to break the scale and re-use the maximum space and material. The circulation is redirected using screens of timber saplings sourced from local alien vegetation. The services are retro fitted with super efficient solar water heating evacuated tube collectors, water efficient flushing devices, rainwater tanks which double up as screens and a biogas methane digester which will supply gas to the chalets.

#### Relevance to target issues (by author)

##### Quantum change and transferability

**Innovative tech.:** Rubble foundations, straw bale, sod roof, solar evacuated tubes, compost toilet, biogas digester, greywater use; locally groundbreaking. **Skills transfer and community involvement:** transfers ideas into community via training. **Appropriate tech.:** local material and simple construction improves accessibility. **Eco-build:** precedent for region, improved marketability. **Non-toxic materials.**

##### Ethical standards and special equity

**Regional development strategy:** the first time in the history of the region that a wide sector of the community were allowed to shape their mutual future. **Multi-level community input:** community input is fostered through local task teams and community forums, coordinated by C.I. **User-friendly non-toxic building materials,** safeguard construction workers and future building inhabitants. **Appropriate technologies to include local community and create jobs:** local, natural material maximises community involvement through material procurement and labour intensive construction. **Local skills transfer and self-management** in the short, medium and long term. **Aligning economic development with biodiversity conservation:** spreads a message that local economic development can bring care and appreciation for environment.

##### Ecological quality and energy conservation

**Siting:** limited to disturbed areas. Existing vegetation provides westerly sun protection to chalets. **Rehabilitation to disturbed areas. Site control:** tender documents specify strict environmental controls. **Water conservation** e.g. rainwater tanks, reed beds, greywater irrigation, efficient fixtures, compost toilets. **Renewable and efficient energy** e.g. solar evacuated-tube and flat-plate water heaters, photovoltaic panels and biogas digesters; efficient appliances. **Low embodied energy:** local, natural and recycled material, results in low transport and processing requirements. **High thermal performance** straw bale and planted roof systems, with controllable vents for cross ventilation, shutters and deciduous planted pergolas. **Low-impact, non-toxic materials:** minimises global and local adverse effects.

##### Ecological performance and compatibility

**Life cycle costing:** Running costs minimised by efficient technologies, high thermal mass. **Job creation and Independence:** local, natural materials reduces transport. **Stimulate local economy** project promotes local crafts and tourism. **Partnership funding** private, provincial and municipal funding. **Flexibility of materials and servicing** for future expansion. **Local materials** ensures money circulates locally.

##### Contextual response and aesthetic impact

**Cultural heritage:** forms make reference to settler buildings. **Materials:** plaster hues and stone soften visual impact. **Landscape:** sod roofs and lean-to's reduce visual intrusion. Stonework cones break monotony of forms and relate to rock. **Buildings support landscape:** greywater irrigates new landscaping in dry climate. **Building reuse:** eco-technologies retrofitted. Renovations break scale of ablutions.