Ecological design: A new way of thinking for design in the South African retail sector

Section 1
Part A

Adrienne Ansems
Student no. 14158051

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Lecturer: Mark Swilling
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I hereby confirm that the assignment is the product of my own work and research and has been written by me and further that all sources used therein have been acknowledge.
Contents

1. Introduction 3
2. Ecological Design in the Built Environment 3
3. Unrealised potential in the retail and shopping mall industries 9
4. Ecological shopping mall design 12
5. The South African Scene 15
6. Green retail in South Africa 20
7. Conclusion 22

Bibliography 23
1. Introduction

In recent years the imperative for ecological design within the built environment has taken on a sense of added urgency and renewed importance. A new way of thinking towards design has emerged. It seems also as if notions of ‘green building’ have evolved to include not only residential and office blocks, but also retail, industry, public and multi-purpose buildings. Because the retail sector is a particularly environmentally intensive one, efforts towards ‘greening’ retail represent an exciting and as yet largely unexplored branch of eco-design. Thus this paper starts off by broadly discussing ecological design and the rational thereof, before entering into an argument regarding the unrealised potential of ecological design within the retail industry. A brief description of ecological shopping mall design ensues, followed by a discussion on the opportune timing for green design within the ‘South African’ scene.

Part A of this study paints a broad overview of the necessity of ecological design within the retail sector (and more particularly within shopping malls), while Part B represents an application of this argument in the form of the case study of the Eikestad Urban Renewal Project currently underway in Stellenbosch. Here the current design of the renewal project is considered a ‘missed opportunity’, and recommendations are given not only to improve the ecological quality of the design, but to also enhance the strategic positioning of the mall as well as efforts at community building within Stellenbosch.

2. Ecological design in the built environment

“We find that we already know how to make buildings live, but that the power has been frozen in us; that we have it, but are afraid to use it; that we are crippled by our fears; and crippled by the methods and the images which we use to overcome these fears.”

- Alexander (1979: 13)

Much of design within the built environment has to do with a certain way of thinking in which society as a whole has been conditioned. As argued by Birkeland, (2002: 13), “the present configuration of factories, city infrastructure, buildings, machines and tools, energy grids and road networks – and even policies and regulations – all bear the imprint of a particular form of thinking that has co-evolved within the context of an industrial model of development.” This way of thinking has resulted in enormous wastages and degradation and the excessive use of fossil fuels and other natural
resources to the detriment of the environment. This way of thinking is inherently unsustainable.

Findings have shown that urban areas represent approximately 75% of global energy consumption and 80% of global greenhouse gas emissions (Seoul Resolution, 2009 in Jong-Heon, 2009). Within this context, “buildings are responsible for more than one third of total energy use and associated greenhouse gas emissions in society, both in developed and developing countries” (Cheng, Pouffary, Svenningsen & Callaway, 2008: 1). In developed countries these figures are even higher – in Britain alone buildings are responsible for about half of the total energy consumption, and about 45% of global warming gas production (Edwards, 1999: 121). Thus the construction and design industry is particularly seen as a sector in which the potential for drastic reductions in energy consumption is significant. The United Nations Environment Programme (UNEP) (2009: 2), based on findings by the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), has even gone so far as to state that in most countries the building sector is “the largest greenhouse gas emissions source.” There is simply no denying it, buildings are massive energy guzzlers. Although energy is mainly consumed during the use stage of buildings (lighting, appliances, heating, cooling etc), about 10-20% of the energy consumed comes from construction, demolition and materials manufacturing. However, this does not even take into account the transport needed to get to these buildings and to move supplies from rural to urban localities (Edwards, 1999: xiv).

Other estimates are equally dismal: buildings consume about one sixth of fresh water supplies, account for over 40% of the world’s annual raw materials consumption, while construction waste produces 44% of landfill waste (Brown, 1996 in Birkeland, 2002: 13; Roodman & Lenssen, 1995 in Birkeland, 2002: 14; Planet One Sustainability Strategies and the Centre for Design, 2003: 4). And taking into account the full life-cycle of buildings, this means 15 to 30 years of environmentally damaging and costly operation that could have been avoided through better design (Planet One Sustainability Strategies and the Centre for Design, 2003: 4). So really, the way of thinking regarding design and construction is crucial to the achievement of a sustainable future (Edwards, 1999: xiv). Thus, a sustainable development perspective entails a complete paradigm shift in design that challenges accepted societal norms (Trainer, 2002: 35).
Fortunately, another way of thinking also exists. This way of thinking goes by various names – sustainable design or ecological design or any variation thereof – but nevertheless is a component of sustainable development which explicitly targets the design dimension of our current environmental crisis. Van der Ryn and Cowan (1996: 18) describes eco-design as follows:

“Ecological design is simply the effective adaptation to and integration with nature’s processes. It proceeds from considerations of health and wholeness, and tests its solutions with a careful accounting of their full environmental impacts. It compels us to ask new questions of each design: does it enhance and heal the living world, or does it diminish it? Does it preserve relevant ecological structure and process, or does it degrade it?”

Birkeland’s argument regarding ‘positive development’ is particularly intriguing. She reasons that sustainability can very rarely be said to be ‘achieved’ unless it in fact increases natural capital and reduces overall resource flows, as opposed to simply just minimising the impact of development on nature (Birkeland, 2008: xv). This Birkeland (2008: xv) refers to as virtuous cycles of ‘positive development’. Another way of looking at ecological design might be to see buildings as our third ‘skin’, where our skin and clothes operate as the first and second layers of skin. Here the health of our ‘third skin’ is not only vital for our own well-being, but also for that of generations to come (Edwards, 1999: 196). On a more practical note eco-design entails “the design of buildings which are more resourceful in the use of energy, robust in use, appropriate in the choice of materials and services and durable” (Edwards, 1999: 124).

However, eco-design goes deeper than this as well. Because the growing inequity in many societies is intricately rooted in current patterns of urban development and globalisation, the need exists for eco-design to also target the side-effects of inequitable wealth transfers (Birkeland, 2002: 16). In other words, eco-design must emphasise inclusively and should help to build communities and societies as a whole. Yet, as Birkeland (2002: 16) explains, “…designers still often serve to enhance the social divisions between their clients and average citizens through design symbolism and conspicuous consumption”. Because ‘green building’ is a notion which represents an integrated, ‘whole system’ approach, in which not only technical aspects but also quality of life issues are considered, it is today considered one of the most credit-worthy off-shoots of eco-design. In this way, “green building is not a standard building with ‘green features’ added on afterwards…[it is an] approach
to constructing a built form that places fresh demands on each stage of the design and construction process” (Planet One Sustainability Strategies and the Centre for Design, 2003: 5).

A new trend in eco-design is zero-carbon buildings – whereby any fossil fuels used in the building are off-set by renewable energies generated on sight (Goodall, 2008: 26). Yet in all practicality within the building industry more positive returns would be secured by spending the same amount of money that could be spent on building a new zero-carbon structure, on ecologically-retrofitting or refurbishing a number of existing buildings. Here the idea would be to simply take these buildings up to acceptable standards of energy, water and waste efficacy. After all, it is not without reason that energy efficacy within existing buildings is viewed as a ‘low hanging fruit’ for climate change mitigation (De Villiers, 2008). In Europe it is telling that the number of new buildings constructed each year may be less than 1 per cent of total building stock (Goodall, 2008: 27). The building refurbishment industry is growing much faster than new construction, and as it is, much of these current developments are unnecessarily wasteful (Property Council, 1997 in Birkeland, 2002: 15). Using the example of refurbishments in the commercial sector, most are very much market driven: aimed at thwarting business rivals, attracting new tenants or clients, or following the latest in interior design fashions (Boilotin, 1994 in Birkeland, 2002: 15). Few pay any attention to the knock-on environmental or social costs of ‘dumb design’.

And make no mistake, eco-design is not only cleaner and healthier for us and for the environment, but can also be very financially lucrative. The ING–bank headquarters building in Amsterdam (formerly the NMB bank), invested $0.7 million in eco-design features, and has since encountered massive savings of $2.4 million a year through reduced energy consumption (estimated to be only 10% of what it was prior to refurbishment!) (Beatley, 2000: 303; Birkeland, 2002: 15). This only goes to support Amory Lovin’s (2005: 1) argument that “increasing energy end-use efficacy – technologically providing more desired service per unit of delivered energy consumed – is generally the largest, least expensive, most benign, most quickly deployable, least visible, least understood, and most neglected way to provide energy services.” With efforts to allow natural sunlight into the ING-bank as well provide for impressive gardens and green spaces, a more pleasant work environment has resulted in increased employee productivity and reduced absenteeism. These unaccounted for
savings push the total amount of savings up to well over $2.4 million per year (Beatley, 2000: 303).

Unfortunately there is no which-way about it – ‘going green’ also involves upfront time, effort, commitment and cost in addition to that which you would expect of any standard development (One Sustainability Strategies and the Centre for Design, 2003: 4). Building owners are often wary of the high perceived business risk of eco-design, and often underestimate the life-cycle cost benefits. There is more often than not no natural incentive for, or convergence of interest in a life-cycle approach to managing energy use in buildings. In fact, energy, water and waste costs are generally considered a comparatively small part of the overall cost of a building (Cheng et al., 2008: 2).

In this way the setting up of public, private and voluntary partnerships during the initial stages of planning can be enormously useful (Edwards, 1999: 192). In fact, ideally local and national government should be committed to ‘green growth’ themselves; with the European experience poignantly highlighting the potentially powerful role government can play as a facilitator and catalyst for sustainable building (Beatley, 2000: 318). In encouraging the development of green building, there is no reason why governments should not set the example themselves. One need look no further than the City of Melbourne’s highly publicised Council House 2 project, a municipal office which has since been awarded a six star Green Star certificate rating for ‘world leadership’ by the Green Building Council of Australia (City of Melbourne, 2009).
As Marloes and Irurah (2006: 205-207) explain, an enabling national policy and legislative framework that includes energy labelling schemes can also act as an incentive for eco-design. Research shows that a mandatory energy audit is the most effective approach to obtaining large-scale reductions in energy consumption, although due to the institutional and skills capacity needed this option remains out of reach of most developing countries (Marloes & Irurah, 2006: 205). Even a voluntary energy audit programme requires ‘oodles’ of government support and the involvement of specialised energy consultants. Thus in many developing countries the best labelling approach is considered to be the voluntary benchmarking programmes, such as the various country-specific green building rating systems found around the world. Examples include Australia’s Green Star Environmental Rating system, Britain’s Building Research Establishment Environmental Assessment Method (BREEAM), and the USA’s Leadership in Energy and Environmental Design (LEED). With voluntary benchmarking programmes the way to determine the energy performance of a building is substantially simpler than an energy audit programme, and often enough a calculation tool can simply be downloaded from the web. Although government support would significantly contribute to the success of the programme, this approach is also highly business orientated and less dependent on government co-operation. However, at the same time this option also requires strong demand-side support from building owners (Marloes & Irurah, 2006: 206).
Another financing option is that of the Clean Development Mechanism (CDM) established under the Kyoto Protocol. This mechanism specifically promotes investment by businesses from developed countries in projects in developing countries as a means of acquiring carbon credits by the investor (Winkler & van Es, 2007: 29). Alternatively, CDM projects may also be initiated in a developing country without a project partner from a developed country (Winkler & van Es, 2007: 30). Disappointingly however, as of May 2008 only six of the 3,000 CDM projects initiated were related to energy efficiency in buildings (Cheng et al., 2008: 2). Cheng et al. (2008: 2) suggests various reasons for this failure, including the argument that it would seem as if the economic incentives of CDM projects are simply not enough to outweigh the associated transaction costs. Included, the CDM is not well suited to support small-scale building projects that use a range of different means to increase energy efficiency. The international rules do appear to be shifting however towards the promotion of further projects within the building and construction sector, and with time it is hoped that the CDM will become a powerful tool in the hands of developers and building owners alike.

3. Unrealised potential within the retail and shopping centre industries

Of all the segments of the commercial building sector, Planet One Sustainability Strategies and the Centre for Design (2003: 4) argue that retail is likely to be the most environmentally intensive one, “each year spending around $170 million on electricity, and contributing to problems such as urban transportation and consumer waste.” In developed countries such as Britain retail represents about 17% of the total stock of commercial buildings, and contributes around 7% of carbon emissions (Centre for Retail Research, 2007, in Thompson, 2007: 1). This figure however doesn’t take into account unforeseen costs such as the transport required to get to the retailers. Green retail centres are springing up all over the developed world, with various note-worthy centres including the following:

- Ireland’s pioneering sustainable building in a city centre setting, the ‘Green Building’ in the built-up Temple Bar area of Dublin. This 14 year old ‘granddaddy’ green building offers office space, retail lettings and accommodation and was fitted with photovoltaics, a heat pump to extract heat from the bedrock below the building, and rooftop wind turbines (MCO Projects, 2006; Cylon Controls, 2005). Although these wind turbines were expected to generate 80% of total electricity, they have since been
switched off (Walsh, 2007). Use of a central atrium running up through the building with a glazed openable roof for fair weather allows both day light and natural ventilation in through the stack effect. Granted, this building did also receive massive funding from the EU in 1990 (Cylon Controls, 2005).

- Sainsbury’s Millennium store on London’s Greenwich peninsula. This shopping mall incorporates many sustainable features including large wind turbines and solar panels located at the store’s entrance, banks of earth surrounding the centre which insulates it from summer’s heat and winter’s cold, toilet water drawn from deep boreholes located 75 meters below the centre, and floor-warming via waste heat burnt within the supermarkets own gas fired power station (J Sainsbury plc, 1999). Future-orientated thinking is also apparent in the recharge points that have been installed for electric vehicles.

- Norway’s Mercursenteret shopping mall established in an old telegraph building in Trondheim. This mall has clubbed together with two other buildings in the area so that in the winter the mall’s heat pump system uses the cooling distribution of the next-door telecommunication centre, and in the summer excess heat from the heat pump is sold to heat water in a neighbouring hotel (Heat Pump Centre, 2002).

The developers involved in these projects have certainly not been shy in exposing the green elements associated with these designs, often using on-site renewable energies as an important statement to reinforce this green aspect. After all, nothing says ‘green building’ like a huge wind turbine greeting shoppers at the mall entrance.
Benefits associated specifically with green building in the commercial sector are listed in Box 1.

Box 1 Benefits of ‘going green’ within the commercial sector
Source: Planet One Sustainability Strategies and the Centre for Design, 2003: 5

- “Substantially reduced operating costs (energy, water, maintenance) for tenants, making possible a premium on leasing fees
- Improved occupant comfort and a healthier working or leisure environment
- Future-proofing against the risk of tightening environmental regulation, increased resource costs or heightened community, investor or tenant expectations
- Increased appeal to local council and other approval bodies
- Capital saving from downsizing infrastructure and services (such as power, water and transport) made possible by better design and greater resource efficiency
- Improved morale of the design and construction team
- Enhanced recognition, and sales and public relations opportunities
- Enhanced skill base and a stronger project portfolio enabling a competitive advantage in ‘green only’ development tenders and in future markets.”

In Europe the demand for eco-design has largely come first from the major retailers as part of a more holistic approach to reducing natural resource consumption by their businesses (Robinson, 2007: 2; Thompson, 2007: 4). In the UK for example, Marks and Spencer has launched a five-year green strategy to combat climate change.
However, consumers in Europe have also shown much support for these moves, and a recent survey indicated that 55% of consumers agreed that they would pay a 10% premium for electronic products manufactured in a more environmentally sustainable way. In Australia and the US the jury is still out, with media hype said to exceed the actual amount of consumer interest (Thompson, 2007: 4). Certainly in these countries, despite growing awareness, neither customers nor tenants will shun a centre just because it isn’t green (Robinson, 2007: 2).

Nevertheless, there is no doubt that green design within shopping malls can be used as a form of strategic positioning, even if just as a marketing and publicity strategy capable of capturing the eye of the media. Strategic positioning is an essential activity in planning any business venture, and helps shape the way a product or service and the place where it is offered will be perceived by consumers (Yiu & Yau, 2006: 273). And in the case of shopping malls, the strategic positioning of a mall must appeal to both ‘customer’ markets – the shoppers and retailers (Yiu & Yau, 2006: 273). In the retail industry the number of environmentally aware and responsible consumers are on the rise, and any forward-thinking shopping mall developers would be wise not only to ‘feed-off’ this trend, but to also expedite it through strategic marketing initiatives (Planet One Sustainability Strategies and the Centre for Design, 2003: 27). Take the example of Tesco and J. Sainsbury’s plc in the UK. With the entry of the US brand Wal-Mart into the European shopping scene these supermarkets used environmental responsibility as a key point of differentiation to recapture markets (Planet One Sustainability Strategies and the Centre for Design, 2003: 27).

4. Ecological shopping mall design

Within shopping centres energy use is an obvious area for improvement (Robinson, 2007: 2). Energy is after all central to the ability of building owners and retailers to improve the environmental credentials of their property (Thompson, 2007: 2). For most retailers the focus here will be more on energy efficiency than generation. In fact, renewable energy should only be considered (and is usually only feasible) once the whole building has been optimised to reduce the need for electrical energy (Planet One Sustainability Strategies and the Centre for Design, 2003: 20). After all, “the most successful green buildings are often more about simple, intelligent design than costly technology add-ons” (Planet One Sustainability Strategies and the Centre for Design, 2003: 6). Thompson (2007: 2) lists the three main culprits in energy use
within shopping centres as being lighting, heating and cooling, and equipment such as computers, cash registers and security cameras. As it is however, lighting is crucially important in the retail industry, not only for display purposes but also for health and safety reasons. In the same way many consumables require cool storage facilities within degrees of a certain ambient temperature (Thompson, 2007: 2). A wider perspective on energy consumption will also take into account more strategic responses, including greater virtuality through e-commerce and online sales, green home delivery using hybrid or electric vehicles, and a green travel plan (Thompson, 2007: 3-4). Ever leading the pack in terms of innovation, Sainsbury currently owns the largest fleet of new technology electronic delivery trucks in Britain, and recently installed Europe’s first green energy system whereby customers create 30kWh per hour by driving over kinetic plates in shopping mall parking lots (Green Car Congress, 2009; Guardian, 2009).

![Kinetic energy plates at Sainsbury's Gloucester Quays store. Source: Guardian (2009)](image)

Green travel plans fall under the holistic approach embraced by green building. Essentially green travel plans ask us to question whether a shopping centre is more convenient for car users or for pedestrians, public transport, bicycles, scooters, wheelchairs, roller-blades and skateboards (Planet One Sustainability Strategies and the Centre for Design, 2003: 25). It supports charging for parking, bus shelters, walkways and bicycle paths, and provides secure lockup facilities and storage for goods (Planet One Sustainability Strategies and the Centre for Design, 2003: 25). As an example, the Marks and Spencer store in Bournemouth, UK, involved all those in the construction process in a signed travel plan stating how materials and construction workers were to arrive at the sight. Since then similar awareness strategies directed at employees and shoppers have aimed to highlight alternative travel options and make them more feasible (Thompson, 2007: 4). In South Korea
the Seoul Metropolitan Government has even gone so far as to reveal plans to extend congestion charges to the ten most congested shopping centres in Seoul in a rather drastic measure to curb traffic congestion and encourage car pooling (Seoul Metropolitan Government, 2008). These measures are not only environmentally friendly but also act as ‘social levellers’. Public transport, for instance, brings rich and poor together in a space devoid of the excessive flaunting of social status characterised by consumer-driven societies.

Yet other issues besides energy consumption should also be on the radar. Water management within shopping malls is vital, particularly in countries such as Australia and South Africa already facing water scarcity problems. Huge gains can simply be made by checking for leaky pipes and providing flow restrictors for taps and toilets. Solid waste and sewage disposal is just as important as are countless smaller points of focus throughout the operational chain. These might include using more appropriate cleaning products and refrigerants, and adopting better cleaning practices. Here Robinsons (2007: 3) advice is to first “fix the obvious problems before tackling the harder issues of thermal quality and solar orientation.”

Shopping centres by nature are also community centres, and more and more green buildings are looking at how they can support the community through providing amenities and spaces for meeting, leisure, dining and entertainment (Planet One Sustainability Strategies and the Centre for Design, 2003: 24). Outdoor activities such as markets or exhibitions are great ways to promote interaction and cultural expression, and have the added benefit of being able to bring a fragmented community together within a common space (Planet One Sustainability Strategies and the Centre for Design, 2003: 24). In fact, buildings and the public space they offer can, if used with a bit of imagination and good-will, help to revitalise an entire town. In terms of community building much can be learnt from the James M. Hanley Federal Building development in Syracuse, New York. Orsborn (2008: 2) describes how government, realising that the public have vested interests which extend beyond the four walls of the federal building, initiated minor improvements such as benches, retractable bollards, picnic tables and better signage to its Hanley Building Plaza. When The Plaza was in need of infrastructure repairs community workshops were held to create a shared vision for this public space. Permission was also granted for a weekly ‘Party in the Plaza’, complete with free live music, dancing and festival food. Although initially the GSA Property Management Office, which handles normal daily maintenance of the Plaza, took it upon itself to provide security and restroom facilities
for these weekly parties, with the growing popularity of the parties these responsibilities have since been handed over to a local community organisation, the Updowntowners.

Hanley Building Plaza, Syracuse
Source: Orsborn (2008)

Yet often ‘greening’ retail is easier said than done. Robinson (2007: 1) explains how many different stakeholders during the planning, building or refurbishment process will need to be brought onboard regarding the necessity of eco-design. Even once the building is up and running, should tenants choose not to cooperate with environmentally sustainable centre operations they can undo a lot of good design and planning. Shopping malls need to accommodate the enormously varying sustainability needs of both the anchor tenants and all the other many smaller tenants, which would mean that while, for instance, the primary natural resource consumed by the hairdressers is water, the primary natural resource consumed by the eateries might be gas or electricity. Also, due to the large land area consumed by shopping malls, eco-retrofitting is often even more expensive than that of an average commercial building (Robinson, 2007: 1). Yet despite these drawbacks it is becoming increasingly clear that there has never been a better time than the present for shopping mall developers to cast aside fears and doubts and to join the Sainsburys, Tesco’s and Marks and Spencers of this world in promoting a new way of thinking regarding design within the built environment.

5. The South African Scene

Currently in South Africa environmentally responsible business strategy is not yet seen as a major marketing edge or means of strategic positioning (Marloes & Irurah, 2006: 206). At the same time however, it is slowly but surely becoming embedded
within South African business culture (Marloes & Irurah, 2006: 206). Certainly awareness regarding climate change and the necessity to conserve natural resources is growing amongst the middle and upper classes (with much thanks to the media for this!), although green building in South Africa still fails to gain the sort of public attention that has come to be expected in developed countries. Up until recently eco-design could best be described as a haphazard, scattered set of buildings and projects very much driven by enlightened members of the public and private sectors as opposed to strong public policy. One of the major problems here has been the lack of a green standard for South Africa. As for government intervention, this has been either non-existent, ad-hoc or inconsistent to say the least (Sebitosi, 2008: 3).

However, this could well change in the near future, particularly with the revising of the current Kyoto protocol which is due to take place in Copenhagen in December 2009. Here it is expected that the second commitment period of the Kyoto protocol will not be so lenient on South Africa as the current one – with it’s coal-based economy South Africa is ranked as the 7th biggest emitter of green house gases (GHG) per capita, with national energy intensity about 3.3 times the average of OECD countries in 2000 (Pretorius & Bleyl, 2006 in Sebitosi, 2008: 2). This despite the fact that in South Africa energy consumption per capita is only 50% the average consumption in OECD countries (Sebitosi, 2008: 2). Seen another way, in 2001 South Africa was the 16th largest consumer of energy, but had only the 26th biggest GDP (DME, 2005: 8). With South Africa using 40% of total electricity consumed within the continent, it’s certainly no joke that “the South African economy uses a lot of energy for every Rand of value added” (DME, 2005: 8).

Although in South Africa the built environment is held responsible for 21% of total energy consumed, the commercial sector buildings represent only 4% of final energy consumption (DME, 2005: 7). However, the Department of Minerals and Energy, in its 2005 document entitled Energy Efficiency Strategy of the Republic of South Africa, readily admits that “although this sector contributes a relatively minor percentage to national energy usage, savings here are known to be significant” (DME, 2005: 15). In fact, as opposed to adding new supply to the grid, energy efficiency is generally regarded as “the cheapest, quickest and most environmentally friendly solution to reducing pressure on the grid for the next five year” (De Villiers, 2008). As part of this Energy Efficiency Strategy a target is set for a final energy demand reduction of 12% by 2015, and a reduction of 15% within the commercial building sector (DME, 2005:
15). Box 2 describes the various new initiatives and legislative moves being undertaken to curb wasteful energy consumption within South Africa.

Eco-design BP regional office in Cape Town
*Source:* Heath (2008)
The 2005 Energy Efficiency Strategy of the Republic of South Africa lays the foundation for the adoption of mandatory energy efficiency standards (DME, 2005: 18). In 1997 already the Council for Scientific and Industrial Research (CSIR) had introduced a voluntary labelling scheme, but this initiative floundered in its early years, with the programme ending in 2001 due to (amongst other reasons) a lack of financial support from government (Marloes & Irurah, 2006: 198).

More recently the SANS 204 standard was published in October 2008 by the South African Bureau of Standards (SABS) as a voluntary standard for improving the energy efficiency of buildings (Naidoo, 2008). Reynolds (SA Roofing, 2009: 4) explains that while “intended for mandatory application in new buildings, SANS 204 can also be used for voluntary energy efficient retrofits of existing buildings, as the owners strive to reduce their electricity and energy accounts.” Here ‘no cost’ and ‘low cost’ interventions are emphasised, including correct orientation of buildings, insulation, shading and window design. Certain recommendations are also laid out for lighting, air-conditioning and lifts etc (Reynolds, 2008: 2). Although there are suggestions that the Department of Minerals and Energy could soon make these standards mandatory, there is no doubt that this will require major institutional capacity building and skills development within the department (Naidoo, 2008: 1). Nevertheless, these measures only seem appropriate considering the record growth in the South African construction industry over the past few years (Winkler & van Es, 2008; 30).

Government is also starting to clamp down on the countries biggest energy users, and by the end of 2009 we are likely to see the top 500 Eskom and municipal electricity customers with an electricity consumption greater than 25 GWh per annum pay various penalties for electricity use (Oldenkotte, 2009: 8). This falls part of the latest proposed draft Power Conservation Programme (PCP) and Energy Conservation Scheme (ECS) produced by the National Energy Regulator of South Africa (NERSA). Although this programme is less punitive than originally expected, within time it is likely the ECS will require all participating consumers to achieve energy saving targets (Oldenkotte, 2009: 8). Regardless of the ECS however, electricity tariff hikes are becoming the norm in South Africa, and have challenged the notion that South Africa’s unit price of electricity remains amongst the cheapest in the world. Therefore, ‘dumb design’ within the construction sector is becoming an increasingly heavy burden for building owners to bear.

As an added incentive for energy efficiency within the built environment the 2009 draft Taxation Laws Amendment Bill proposes an income tax rebate for any business that takes part in a UN CDM project. In addition, the amendments open the way for “business to obtain notional deductions for income tax purposes for energy efficiency savings from certified baselines based on energy efficiency certificates issued by the National Energy Efficiency Agency” (Reichardt, 2009). Such a move will come as music to the ears of the growing number of commercial buildings in South Africa that have adopted progressive energy efficiency measures. One such example is the BP regional office in Cape Town, which today is consuming less than half the energy of an average South African office building, resulting in huge annual emissions savings of around 2 474 t CO2 (Winkler & van Es, 2007: 30).

This news will also be welcomed by the Energy Efficiency Initiative, a Sustainability Institute and Cape Town Partnership collaboration launched in 2007. This initiative is South Africa’s very first city-level public private partnership to facilitate energy efficiency implementation measures, and current undertakings include energy audits and retrofits of some of Cape Town’s most well-known commercial buildings (De Villiers, 2008).
However, none of the measures mentioned in Box 2 cover the full spectrum of eco-design. In fact, only one area of green building is targeted: energy efficiency. It is only understandable that the need to conserve energy has taken centre stage in South Africa in light of the countries debilitating lack of electricity capacity, resulting in country-wide rolling black-outs between 2006 and 2008, but at the same time focus also needs to shift to other aspects of sustainable design. A break-through initiative in the green building movement in South Africa has been the introduction of a Green Star SA rating tool, developed by the Green Building Council of SA (GBCSA). This web-based tool aims to “provide the property industry with an objective measurement for green buildings and to recognise and reward environmental leadership in the property industry” (Green Building Council of SA, 2008). As Lisa Parkes (2009) of the GBCSA explains, “developers and owners can use the tool to ensure they have considered all aspects related to green and ultimately have their building certified as a 4, 5 or 6-star Green Star building”.

The rating tool is largely based on the Australian Green Building Council tool given the similarity in climatic conditions of the two countries, with the project manager Michelle Malanca a former Australia Green Star director (Spadavecchia, 2008: 6). However, the tool has also built on the BREEAM and LEED rating systems, and incorporates the requirements of Sans 204 (GBCSA, 2008). Although 70-80% of the credits are core credits which will be common to all tools, each Green Star SA rating tool will also be made applicable to different market sectors (office, retail, industry, multi-unit residential, single-unit residential). While the first tool – Green Star SA Office – was launched in November 2008, the GBCSA hopes to launch the pilot version of the Green Star SA Retail tool at its 2nd annual Convention & Exhibition in October 2009 (Parkes, 2009). This tool will be applicable to both individual shops as well as larger shopping malls. And the good news is, according to the GBCSA many major commercial developments in South Africa are already gearing up to apply for Green Star SA rating status (Spadavecchia, 2008).

Launched in 2007, Green Building Media has also played a key role in green building in South Africa through its online informational portal, South African e-Journal of Green Building, and various other events including an annual Green Building Conference (Green Building Media, 2009). Further enhancing green building the CSIR has also stepped up to the plate through its investment in research and development and the creation of an advanced technology platform. The idea behind this platform is to promote open building – whereby structures are designed in such a
way that they can easily be dismantled later as opposed to simply demolished. Because this would involve a shift from building on-sight to producing the components of a building in a factory, the CSIR is currently exploring the use of light-weight steel and natural fibres as a replacement to conventional heavy construction materials (Spadavecchia, 2008).

6. Green retail in South Africa

In South Africa numerous shopping malls have begun to green their processes and in small ways are switching to more environmentally friendly building operations. As Devenish (2008) explains, shopping malls such as Gateway, Menlyn, Canal Walk and Pavilion have been recycling waste since 2001, with most of these malls recycling in excess of 50% of waste. Many of these same malls have switched to compact fluorescent lights and hand sensor bathroom taps, and use water-wise indigenous plants as opposed to exotic plants. Currently however (and as far as the author is aware), no shopping mall in South Africa could profess to ‘being green’ by any international standard. Also, most South African middle and upper-middle class shoppers tend to be very car dependent, convenience-based shoppers, who although theoretically might support the principles of environmentally-conscious retail, are generally not willing to extend themselves so far as it might inconvenience themselves or their purses. For the 40% of South Africans living in poverty, and more particularly for the poorest 15% for whom life is simply a day to day struggle to survive, the rising cost of basic food stuff, electricity and public transport is of far more a concern than notions of environmental sustainability and eco-design.

Thus far many of the major national retailers have been more preoccupied with green procurement – the selection of products and service providers that minimise harm to the environment – than green building (Salgado, 2009). As shoppers continue to demand sustainability in some of the more exclusive retailers, the rating of suppliers in terms of environmental practices has largely been driven by the private sector as opposed to government. Also, this move seems to have been led by the local operations of multinationals based in the US or EU, with the actions of multinationals such as Wal-Mart having a knock-on effect on the South African retail industry (Salgado, 2009). Various retailers have also been influenced by Woolworths which uses its green credentials as a form of strategic positioning and marketing edge. Woolworths launched its Good Business Journey in 2007 as a way of marketing its
shift towards organic and fair-trade foods and its involvement in corporate social responsibility (Woolworthes, 2008).

According to Devenish (2008), one of the most environmentally proactive shopping centres has been Cape Town’s Victoria and Albert Waterfront which, frustrated with waiting for national retail standards, has gone ahead and developed its own green building standards. In March 2008 the executive committee committed the Waterfront to ‘going green’, and has since followed through with staff and tenant education as well as a utility management focus. Here water and electricity sub meters have been installed and an audit of electrical and water systems undertaken. Drip irrigation has largely replaced spray irrigation, and three lifts have been replaced with new energy efficient alternatives. Variable speed drives and upgraded control systems were installed in the air-conditioners and inefficient light fittings and lamps replaced. However, the Waterfronts true innovative potential lies in its desire to capitalise on one of its most taken-for-granted resources – the sea. Plans in the bag include seawater cooling within air-conditioning systems, and investigations are under way to explore the feasibility of off-shore wind turbines (Devenish, 2008).

Eco-design within the retail sector is sure to receive a boost within the near future – not only through the introduction of the Green Star SA Retail tool but also with the construction of two new large-scale green development projects in Gauteng. These include Menlyn Maine in Pretoria and Zonk’izizwe Town Centre planned around the new Gautrain station in Midrand. Grant (2009) describes how these projects form part of the 16 founding projects of the Climate Positive Development Programme (an initiative of the Clinton Foundation) that will seek to reduce the amount of on-site CO2 emissions to below zero and set an example for sustainable urban growth within 10 chosen focus countries. More details regarding these projects can be found in Box 3.
Menlyn Maine will incorporate shops, restaurants, office space, entertainment, hotels and residence apartment blocks within easy walking distance of each other, while the focus of Zonk’izizwe will be more on entertainment and leisure. This development will include museums, outdoor shopping, multiplex cinemas, a nightlife village, an aquarium, a lake, parks, themed-adventure experiences and of course the usual array of retail, office and residential space (Grant, 2009). On the cards is compliance with the Green Star SA Rating tool, which will mean that both developments will incorporate “energy efficient systems, locally produced or recycled building products, and water saving appliances (such as low-flush loos), water-efficient irrigation systems and stormwater harvesting” (Grant, 2007). According to Development Design Group (2009), the US-based planning and design group responsible for the Zonk’izizwe development, an innovative feature of Zonk’izizwe will include bio-water recycling and purification. Development Design Group (2009) goes on to describe how “a distinctive curvilinear shape defines the core of Zonk’izizwe, giving an unmistakably African imprint to this branded town centre development.”

Box 3 Menlyn Maine and Zonk’izizwe of the Climate Positive Development Programme

7. Conclusion

Thus we have reviewed the current state of play for ecological design and green retail both within international spheres as well as locally. Although ecological design is recognized as including additional upfront costs, and while it has yet to have truly sparked the interest of the South African public, the operational life-cycle benefits as well as the benefits of numerous largely unaccounted for elements (such as enhanced strategic positioning and marketing) can be substantial for shopping mall developers. The time for ecological design in South Africa has arrived, and the following part of this paper looks at the example of the Eikestad Mall in Stellenbosch as a building with much potential for ecological design. Here it is proposed that ecological design be used as a tool to enhance social cohesion and create a shared public experience within a town traditionally characterised by high levels of inequality and diversity.
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The Eikestad Urban Renewal Initiative: A missed opportunity for holistic ecological design within the retail sector

Section 1
Part B

Adrienne Ansems
Student no. 14158051

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Lecturer: Mark Swilling

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I hereby confirm that the assignment is the product of my own work and research and has been written by me and further that all sources used therein have been acknowledge.
## Contents

1. Introduction ........................................... 29
2. The Stellenbosch Context .............................. 29
3. Eikestad Urban Renewal Project ..................... 30
4. Sustainability measures within current the current refurbishment .......................... 34
5. Eikestad: The new ‘Exclusiveville’ .................. 37
6. Greening the heart of Stellenbosch: A new branding for Eikestad Mall ..................... 39
7. Making it happen ...................................... 41
   7.1 Management ........................................ 41
   7.2 Indoor Environment Quality ....................... 43
   7.3 Energy ............................................. 45
   7.4 Transport ......................................... 46
   7.5 Water ............................................. 47
8. Community building through use of public spaces ........................................... 48
9. Comparing the current refurbishment with a sustainable alternative ..................... 50
10. Conclusion ........................................... 52

Bibliography .............................................. 53
1. Introduction

Although much has been written about ecological design, few authors have seemingly grasped the potential of ecological design within the retail sector as a tool for enhancing social cohesion. The following paper builds upon the rationale of ecological design presented in Part A by arguing that because ecological design presents the opportunity to create an alternative branding and marketing ‘image’, one that is not solely based on affluent interior design and retail offerings, it allows for the creation of inclusive mall spaces capable of attracting a wide variety of shoppers from all walks of life. In the ‘new South Africa’, where formal Apartheid ended 15 years ago, but where high levels of division and social inequality still continue to permeate society, the need exists to create public spaces capable of bringing people together as opposed to highlighting differences and perpetuating antagonisms.

Here the case study of the Stellenbosch’s Eikestad Urban Renewal Project is viewed as a ‘missed opportunity’ in terms of ecological design. Within this paper current plans for the project are followed by a description of Eikestad Mall as the new ‘Exclusiveville’. The benefits of ecological design particular to Stellenbosch are listed, and practical recommendations are given to substantially improve the ecological quality of the Eikestad Mall. These recommendations include both technical aspects as well as quality of life issues, and conclude by suggesting means by which community building can be encouraged through appropriate design and initiative.

2. The Stellenbosch context

Stellenbosch, South Africa’s second oldest town with a population of approximately 135 000, is amongst the fastest growing medium-sized town economies in South Africa (Zietsman, 2007: 40). Much of this growth is related to tourism development and the increased popularity of the wine industry as well as more recent diversifications into trade, IT and finance. The local accommodation, restaurant and wine farm tourism sector caters very much for an upper-income tourism sector, with tourism contributing approximately 25% of Stellenbosch’s growing retail market (PPT Pilot Projects in Southern Africa, 2004).

However, Stellenbosch is certainly not devoid of problems either. A recent audit commissioned by the Department of Co-operative Governance and Traditional Affairs found that Stellenbosch has of the worst water and sanitation infrastructure conditions in the Western Cape (Gosling, 2009). Further, Swilling (2009) reports that the
Stellenbosch solid waste landfill has reached maximum capacity, with long-term planning also needed to avoid water and electricity shortages. To top this off, Stellenbosch is growing at such a furious pace that it could well double in population within the next 20 years (Swilling, 2009).

Along with Brazil, South Africa has of the most unequal income distributions in the world. In fact, UN Habitat’s 2008/2009 State of the World’s Cities report has officially revealed that South African cities are the most unequal in the world (UN Habitat, 2008:xi). Stellenbosch, reflecting a microcosm of the wider patterns of inequality found within South Africa, is a highly divided town. A 2006 study revealed that 26% of the potentially economically active population is unemployed, and while the average monthly per capita income was R2101 in 2001, this pattern is highly skewed (Zietsman, 2007: 34). For instance in 2001 the African population earned an average monthly income of R612, the Coloured population an average monthly income of R968, and the White population an average monthly income of R6463 (Zietsman, 2007: 34). Thus poverty in Stellenbosch follows a distinctly racial pattern - the Coloured and Black populations largely compromise the lower income earning brackets while the Whites occupy the upper-middle and upper income earning brackets. So the question remains, how does one create unity and commonality within this town let alone an entire nation? How does one literally go about ‘building a community’ within Stellenbosch? This was one of the issues I was faced with while contemplating the Eikestad Urban Renewal Project.

3. Eikestad Urban Renewal Project

The Eikestad Urban Renewal Project involves the R1-billion ‘renewal’ (or what might more appropriately be called the full refurbishment), of a number of buildings in the town centre slightly to the west of Stellenbosch’s historical core. This initiative follows on the 2004 upgrade of a portion of the town within the historical core, and is generally in keeping with the nation-wide trend towards revitalizing town and city centres. The Eikestad Urban Renewal Project incorporates the Eikestad Mall, the Drosdy Centre, the De Waal Centre and a few other adjoining buildings. With the view that Stellenbosch already has an abundance of B-grade shopping areas, and that the town is losing out to shoppers who otherwise opt for a more pleasant A-grade shopping experience in neighbouring town malls, these buildings were all purchased as a joint venture between local developers Key Capital Property Investments (KCPI) and Abacus Asset Management. Much of the following
information was obtained via an interview with Abacus property developer, Jan de Villiers, on the 30\textsuperscript{th} June 2009.

Since August 2008 construction teams have aimed to tackle what is seen by some as the problems faced by the town centre: insufficient parking, lack of accommodation and a rising demand for A-grade retail and urban renewal within Stellenbosch’s historical core. The plan is to develop a mixed-use shopping centre comprising approximately 35 000\,m\textsuperscript{2} of retail space (an increase from 24 000\,m\textsuperscript{2}), 1000 new parking bays, a luxury residential apartment, A-grade office space and a boutique retail and commercial centre. Proposals have also been made to convert the Drosdy Centre into a 100 room 4 star Hotel, something which has been identified as a need within the town centre. The refurbishment of the Eikestad Mall will be finished by the end of 2009, with the parking complex, Andringa Walk (residential component) and Mill Square (boutique retail and commercial square) competed by the end of 2010. Although within this article consideration is given to the Eikestad Urban Renewal Project as a whole, the primary focus here will be the major refurbishment underway at Eikestad Mall.
Eikestad Mall, a 1960s building previously known as the Trust Bank Centre, last underwent a refurbishment in the late 1980s. According to De Villiers (2009), Eikestad Mall was built as a ‘.patched-on affair’, with a lack of off-loading facilities and an ‘odd mix’ of B-grade local ‘ma and pop’ type stores as well as national retail outlets. Also, because the first floor was only accessible by stairs, one escalator and one inconveniently placed lift, this resulted in far less foot traffic on the 1st floor than the ground floor.

Few people will doubt that the mall was in need of an upgrade – with its poor lighting and outdated design the mall had come to take on a dilapidated look unfitting for the centre of Stellenbosch. Refurbishment will feature the usual array of national chain-store shops (Edcon, Foschini, Truworths, Clicks, Ackermans, Mr Price as well as eateries by established groups such as Romans, Wimpy, KFC, Spur and Cafe Dulce), with the previous ground-floor anchor food tenant, Shoprite, replaced by the more up-market Checkers. At the time of this study it was uncertain where Shoprite, largely catering for the lower income-earning bracket, would be relocating to. Woolworths will act as anchor tenant on the first floor, offering a wide range of quality clothes, food, homeware, cellular and financial services. A ‘family entertainment node’ will be established on the 1st floor complete with a cinema complex and some of South Africa’s most well-known family eateries.

Care has been taken to ensure that the modern external design of the refurbishment will ‘synergise’ well with the surrounding historical buildings, a requirement strictly enforced by Stellenbosch building regulations and the Stellenbosch Aesthetics
Committee. Internally the design will include sleek, clean-cut imported floor tiles, imported wood veneer panelling, reinforced glass partitions and artificial sky lights creating the impression of space, shine and natural lighting. Through the use of much lighting and glass partitions individual retailers will have ample opportunity to ‘showcase’ their products, with the total effect being one of futuristic elegance, opulence and first world appeal.

Proposed exterior appearance
Source: Abacus (2008)

As part of their corporate social responsibility Abacus and KCPI have ear-marked four shops for local entrepreneurship development, a venture to be facilitated by the Small Enterprise Development Agency (SEDA). A school hall will also be built in Kayamandi using some of the unused building material from the renewal initiative.

Proposed interior design: sleek, clean-cut finishes
Source: Abacus (2008)
In obtaining approval for the renewal project Abacus and KCPI followed the standard public participation measures outlined by town planning guidelines. Local town planners were brought on board and consultation took place with various interest groups including the Stellenbosch Interest Group, the Stellenbosch Ratepayers Association and the Stellenbosch Aesthetics Committee. Newspaper paper articles were also released for public comments. The major objection to the initiative by interest groups has been directed at the proposed 1000 bay parking complex. While these associations believe that by introducing more parking in Stellenbosch more people will be encouraged to take their cars into town, Abacus and KCPI argue that by positioning the parking complex on the periphery of the historical core cars will in fact be deterred from entering the historical core and endlessly circling to find parking.

4. Sustainability measures within the current refurbishment

Although the current refurbishment will not entail all the changes that would be needed to qualify the new mall as ‘green’ as such, to some degree it will ensure that the energy efficiency and natural resource management of the mall is improved. However, this is very much done under the ethos of ‘impact mitigation’ as opposed to Birkeland’s notion of ‘positive development’.
Air-conditioning in malls tends to be a major avenue of energy consumption, and thus one of the features of the new mall will be a high-efficiency chilled water system. This system will provide centralised air-conditioning as opposed to the traditional split-unit system, and will ensure that electricity is more efficiently used. Although no estimate costs could be obtained for the installation and life-cycle operation of such a system, it was indicated that this would compromise one of the most expensive investments made by the developers (particularly in terms of the high installation cost of the system and the vast amount of floor area that will need to be covered). However, the rational of conserving energy via a high-efficiency chilled water system is somewhat undermined by the large amounts of glass partitioning used in the design of the individual retail outlets.

Because malls generally include much built area which is not accessible by windows they tend to use excessive amounts of artificial lighting. For instance, in an energy audit conducted in the current Shoprite it was found that the supermarket alone uses in excess of 375 tube fluorescent lights. LED, compact fluorescent lighting and other energy-efficient lighting will be incorporated within the design of the current renewal initiative where feasible. In the mall passageways 36W Fluorex Fluorescent tubes, compromising artificial sky lights, will be interspersed with 1W LED cone downlighters (‘star lights’). Individual retailers will also be encouraged to consume electricity more wisely, particularly those such as jewellers that use abundant amounts of lightening for display cabinet purposes. This said the entire design of the refurbishment is largely based on creating a lighter and more modern appeal, which
in itself is heavily reliant on electrical lighting. Thus we see that the display and ‘branding’ requirements of the shopping mall stand in direct conflict with the principles of energy efficiency and sustainable resource consumption.

Further eco-friendly measures include the enzyme-dosing of all sewage to minimise the risk of the spread of pathogens during sewage over-spill. Also, a Geberit’s flush-toilet system has been installed for most toilets. Here 6 litres of water are used per flush, and although I was unable to find out how many litres per flush the previous system used, it is likely safe to say that it was comparably more. The Geberit Group, with headquarters in Switzerland, is one of the European leaders in sanitary technology and innovation, and has committed itself to achieving more economic water consumption and improved standards in hygiene and acoustic insulation (Geberit AG, 2008). Despite the installation of a Geberit system the potential for improvements in water-saving within Eikestad Mall remains vast, particularly when taking into account Geberit’s new prototype toilet which allows water consumption of less than one litre per flush (Geberit AG, 2007: 33).

Eikestad Mall: Old versus new
Source: Adrienne Ansems (2009); Abacus (2008)

Once the mall is fully operational recycling will take place on sight, and will be removed by an independent sub-contractor. Eikestad mall cleaning staff will be charged with separating recyclable from non-recyclable materials.
Despite pressure from the Stellenbosch Interest Group to completely pedestrianise adjacent Andringa Street as well as Church Street (which intersects with Andringa Street in the historical core of Stellenbosch), KCPI and Abacus have instead submitted a municipal appeal that ‘traffic calming’ measures be adopted. Although the traffic engineers hired by Key Capital Property Investments and Abacus investigated the possibility of pedestrianising Andringa Street, their results concluded that due to the already complex system of one-way roads in the near vicinity, further interference would simply place Stellenbosch traffic flows in disarray. Rather, these engineers recommended that the Andringa Street loading zones be moved and that the area be levelled and resurfaced with paving stones. The introduction of bollards will also ensure a wider pedestrian walkway. Paid parking for shoppers will be the norm within the new parking garages, while the Beyers Street passage (although remaining a pedestrian walkway) will be re-surfaced in the same style as Andringa Street and widened through the removal of several large kiosks. Here the possibility exists for European café style development to take place, and investigations are underway to see whether it will be feasible to introduce smaller kiosks in the effort to promote local entrepreneurship.

Proposed ‘traffic calming’ measures for Andringa Street
Source: Abacus (2008)

5. Eikestad: the new ‘Exclusiveville’

Although there is no doubt that Eikestad Mall was badly in need of some sort of refurbishment, my concern remains that Eikestad as it previously stood was an
inclusive ‘everybody mall’ stocking ‘everyday retail stores’, while plans for the new mall remain tinged with a mix of exclusivity and blatant affluence. But isn’t an ‘everybody mall’ stocking ‘everyday retail stores’ only fitting for a development placed squarely in the middle of town? My particular interest in the Eikestad Renewal Project was first triggered in early 2009 when in conversation with the managers of a local photo development shop and optometrist (two previous tenants of Eikestad Mall), I was shocked to find that KCPI and Abacus were asking a rental increase of approximately 200%. Also, should previous tenants wish to remain they would be required to upgrade the appearance of their shops to the tune of about R500 000. Thus both the photo development shop and optometrist had decided they would not be returning to Eikestad Mall on completion of the refurbishment. The manager of the photo development shop recalled with particular nostalgia how his photo shop had been premised in Eikestad Mall for the past 30 years, since the days of the Trust Bank Centre.

And yes, the lower income earners who frequent Shoprite might justifiably feel that the mall has been co-opted by the middle and upper classes. After all, the selection of retail outlets and sophistication and shine of the new interior design would hardy appear geared towards them. Surely within an already highly divided town efforts should be made to unite and build the Stellenbosch community as opposed to starkly highlighting inequalities and opulence? And should luxury apartments truly be considered a priority within a town badly in need of affordable housing? Could not wider public participation have been encouraged in the utilisation of public spaces such as the Beyers Street passage?

First world opulence and commodification
Source: Abacus (2008)
Considering the negative feelings now harboured by local retailers who have had to move out of the mall, as well as by the vast number of lower income earners for whom the development will hold little benefit, I can only think that greater creativity should have gone into exploring alternative options - options that would have appealed to a larger segment of the population. Creativity should have been utilised in developing a strategic marketing position not simply based on a luxurious interior design and selection of pricey A-grade national retail stores with token recognition of emerging local entrepreneurship. Creativity should have been used to ensure that money coming into Stellenbosch continues to circle within the local economy, equitably benefiting all as opposed to disappearing into the pockets of national retail executives. The following section of this article examines the possibly of green building as a means of promoting sustainability as well as community building within the heart of Stellenbosch. Included, green building is examined in light of its potential to boost Eikestad Mall’s strategic ‘edge’.

Anchor stores will no longer be catering for lower income earners
Source: Adrienne Ansems (2009); Abacus (2008)

6. Greening the heart of Stellenbosch: a new branding for Eikestad Mall

The time is right for green building to truly ‘make a mark’ in South Africa, and nowhere would this be more appropriate than in the heart of Stellenbosch, as an alternative to the current Eikestad Urban Renewal Project. With the green star SA rating tool for retail on its way, and with various other malls such as the Waterfront getting in on the act, there is no reason why Eikestad Mall should not establish itself as a leader in innovation and responsible retail. Perhaps by using green retail as a form of branding and strategic positioning, Eikestad could even market itself as the ‘First Green Mall in Africa’? Here there would be no need then to base Eikestad Mall’s strategic positioning on a luxurious interior design and selection of pricey A-
grade national retail stores. After all, the English translation for *Eikestad* is ‘town of the oak tree’, and thus a green branding for the mall would be very much in keeping with leafy Stellenbosch’s appreciation for its historical oak trees and fantastic natural setting amongst mountains and vineyards. Using green building as a form of strategic positioning would have various benefit for Eikestad Mall and surrounding buildings as listed in Box 4.

| ✓ recognition for environmental responsibility from government and public |
| ✓ media attention |
| ✓ green retail ‘show case’ status and test-bed for innovative eco-design and construction |
| ✓ support from the upper-income tourism sector, who are likely to be more ‘green savvy’ than the average South African |
| ✓ a more inclusive environment through the ‘toning down’ of affluent interior design |
| ✓ possible support from a wide range of retailers, including Woolworths and Wal-mart |
| ✓ enhanced branding through community building initiatives |
| ✓ added attraction to the town as a whole (Stellenbosch recognised as the ‘innovative town’) |
| ✓Reduced operating costs for tenants (water, electricity, maintenance), making possible a reduction on leasing fees |
| ✓ alleviation of pressure on local sewage plant, landfill, electricity grid and scarce water resources |

**Box 4  Green building as a form of strategic positioning for Eikestad Mall**

However, there is no doubt that the refurbishment of an outdated building into a modern, environmentally sound constructions will come at a steep price. Here the possibility exists for developers to compromise on expensive building materials such as imported tiles, wood veneer panelling and reinforced glass partitioning, and instead invest this money in improving the life-cycle efficiency of the building as a whole. This, after all, would be in keeping with the need to ‘tone down’ the affluent interior design. However, because a key priority would also be to support local entrepreneurship and ensure that tenants do not pay substantially more rent than they would have prior to refurbishment (so ensuring a vibrant mix of shops that cater for both lower and middle income earning categories), additional funding will likely need to be secured. Possible sources could include: the African Development Bank, the World Bank, the Clinton Foundation, UNEP through the CDM, Woolworths, the
Stellenbosch Municipality, the Winelands District Municipality and the Department of Environment and Tourism (DEAT).

7. Making it happen

Abigail Daubenton (2009) of the Green Building Council for South Africa advises that until such time as the Green Star SA Rating Tool for retail is released, prospective developers and building owners should consult with the South African Green Star office tool as well as the Green Building Council of Australia’s (GBCA) Green Star rating tool for retail. These rating tools will present developers and owners with an appropriate sense of the type of criteria that will be rewarded in the Green Star SA Rating Tool for Retail. Once the SA retail rating tool is released building information and calculations can then be submitted for formal certification by the GBCSA.

This said, both the South African Green Star office tool as well as the Australian Green Star rating tool for retail are used in the following recommendations for Eikestad Mall. Both tools assess the environmental attributes of new and refurbished buildings according to nine categories: Management, Indoor Environment Quality, Energy, Transport, Water, Materials, Land Use and Ecology, Emissions, and Innovation (GBCSA, 2009, GBCA, 2008). A number of key ‘sector specific’ credits differentiate the Australian Green Star – Retail Centre v1 rating tool however. These include: Waste and recycling management plan, Building management system, Car park ventilation, and Trip reduction – mixed use (GBCA, 2008). Although the focus of the following section will be on Management, Indoor Environmental Quality, Energy, Transport and Water, recommendations for Materials, Land Use and Ecology, and Innovation can be found within Box 5.

7.1 Management

“In fact, it seems as though sustainable buildings and urban environments are not just achieved through using the right tools, or the right information, or even the right education; but through all of these plus consideration of current culture and ways of doing things.”

- Hes, 2003: 2

These were the words spoken by Hes on her reflection of the building of the Reservoir Civic Centre in Melbourne. Here she grapples with the fact that although many architects, engineers, town planners and construction management contractors
etc wish to be involved in green projects, they often don’t realise that it requires a change in cultural frameworks as well. As Hes explains (2003: 4):

“The engineers were invited to workshops, targets set and issues discussed with them at length. They all understood the ‘green’ agenda. The problem was that in some cases...they would go back to their office and treat the project as any other, applying the same technologies, tools, set of beliefs and values. Similarly, once the construction management contract had been let with specific ‘green’ requirements they soon returned to their ‘culture’, applying the tools, set of values and beliefs as was their usual practice.”

In order to avoid this scenario the Green Star SA office tool (GBCSA, 2009) highlights the importance of involving a Green Star SA accredited professional as well as an independent commissioning agent able to help with problems and provide advice and a ‘watchful eye’ from planning through to the construction phase. Also, the design team and contractor must be in a position to transfer project knowledge to the building owner, with ideally an easy-to-use Building Users’ Guide handed over to the owner, occupants and tenant representative bodies. In the same way, the building owner or developer should also make the design team responsible for demonstrating commitment to a well-defined sustainability vision. Continuous monitoring and record keeping of all building operations and life-cycle processes is vital, and all outcomes must be reported to the building owner on a continuous basis.

Planet One Sustainability and the Centre for Design (2003: 7-8) stress the necessity of selecting a design team that is creative and flexible and has understanding and experience with green building projects. Included, the designers must be willing to communicate with sub-contractors, engineers, town planners, landscapers, contractors and building owners using non-linear, integrated, team-based communication systems (Planet One Sustainability and the Centre for Design. 2003: 7). This is because team based management allows problems to be identified and solutions generated before huge costs are occurred and time is wasted.

Further, the subcontractors also require support so that they too can understand the green initiatives taking place on sight (Hes, 2003: 6). An on-site induction session into the objectives of the project and training on how workers can contribute could well create the sort of team interest vital in ensuring that everyone is ‘onboard’ with the new green agenda (Planet One Sustainability and the Centre for Design. 2003: 8). And in South Africa attending workshops and obtaining additional skills should always be seen as an asset, particularly for low-skilled subcontractors for whom this might mean not only better wages but also increased job security.
Communication is thus key to the success of an eco-design project. Should Abacus and KCPI wish to ‘go green’ this would certainly be an aspect that would need to be re-evaluated. De Villiers (2009) himself stated that he is largely unaware where the contractor, NMU, sources building materials, what sort of training subcontractors receive, or the measures that are being implemented to ensure water-wise management. His response was simply that he trusts NMU to give Abacus and KCPI “the best deal for our money’s worth.” Such a response would hardly appear sufficient given the holistic approach embraced by green design.

Management also involves consideration of a waste and recycling management plan (GBCSA, 2009). Here Eikestad currently scores quite high with its intention to implement an on-site recycling programme once building is complete. However, the recommendation here would be that a divided collection model is adopted as opposed to a mixed collection model followed by manual separation by mall staff. This would improve the quality of waste components, and ensure that a greater quantity of waste is diverted away from landfill (Fehr & Calcado, 2003: 3). Thus within the shopping centre itself shoppers and tenants would be required to separate biodegradable waste from dry waste, with two separate bins present at each waste collection point. The humid waste could then either be taken to a bio-gas digester or composting area, and the recyclables taken to an area dedicated to sorting. In this way landfill diversion of up to 80% becomes possible (Fehr & Calcado, 2003: 1). Here the presence of many restaurants within the refurbished Eikestad Mall might well make the application of an on-site bio-gas digester feasible.

### 7.2 Indoor Environment Quality

According to the Green Star SA office tool (GBCSA, 2009), recognition of indoor environmental quality means an understanding that any design must provide ample amounts of outside air to counter-act the build-up of indoor pollutants, and that CO2 levels should be monitored so as to ensure optimum quantities of outside air. Buildings should also provide good levels of day-lighting, and where appropriate reduce the discomfort of the glare from natural light by means of fixed shading devices. Ideally, buildings should provide a high level of thermal comfort as well as internal noise levels that are of an appropriate level. A comprehensive hazardous material survey must be carried out on the sight prior to building, and interior finishes should minimise, where possible, the levels of Volatile Organic Compounds within the building. Thus, for instance, where good design is not able to totally eliminate the
need for painted finishes, lead-free and water-based paints should be employed (Edwards, 1999: 124).

As an alternative to the costly and electricity-dependent chilled-water system, the Eikestad renewal project could instead consider a passive heat-well ventilation system which drives unwanted heat out of the top of a building while allowing light and natural air to flood in (Planet One Sustainability and the Centre for Design, 2003: 10). Perhaps it might even be worth investing in a ‘ventilation chimney’ as has been incorporated into the design of the Queens Building at De Montfort University in Leicester? (Beatley, 2000: 303). Here solar energy heats the chimney and the air within it, creating an updraft of air in the chimney. As a rather extreme measure the openable roof found in Dublin’s Green Building could be included into the design of Eikestad as well.

Easy gains in providing thermal comfort are also possible through better insulation (Goodall, 2008: 25). During summer a thick and effective barrier of insulation combined with airtightness and forced ventilation can all work to keep the heat out just as well as they can ensure winter comfort (Goodall, 2008: 9). Thermomass and double-glazed windows might be considered here. Thermomass, a sheet of polystyrene insulation wedged between two layers of concrete, greatly helps improve the thermal performance of a building (Planet One Sustainability and the Centre for Design. 2003: 11). Using large sheets of glass as a form of partitioning for individual retail stores is a definite no-no, and will simply ensure that air-conditioning and heating systems have to work even harder.

Despite all the many innovations incorporated within Sainsbury’s Millenium Store, the one that has led to the most positive customer and worker feedback has been the vast amounts of natural daylighting incorporated within the design (Planet One Sustainability and the Centre for Design, 2003: 11). Although currently parking space sits atop Eikestad Mall’s 1st floor, my recommendation would be that all 3 artificial skylights on the 1st floor be replaced with natural daylighting. After all, no simulations are truly able to provide the sort of pleasant ambiance created by natural daylighting. This move would immediately create a total space of 194 m2 available for natural daylighting. Energy savings would also be vast considering the number of 36W tube fluorex fluorescent lights employed in creating these skylights – a total of approximately 190 on the 1st floor alone. This equates with a total savings of 6840W of electricity.
Fluorescent skylights installed as part of the current refurbishment  
*Source: Adrienne Ansems*

7.3 Energy

Points awarded under this category by the Australian Green Rating Tool for retail (GBCA, 2008) include primarily the recognition of designs that minimise greenhouse gas emissions. However, building owners are also encouraged to install energy sub-meters as well as make use of energy efficient car park ventilation technologies. Recognition is also given to designs that reduce peak demand on energy supply infrastructure.

Eikestad Mall could also choose to include an energy efficiency clause in tenancy contracts, mandating tenants to use energy more frugally. Although the use of renewable technologies such as wind turbines, solar panels and geothermal technology are not specifically mentioned in either the South African office tool or the Australian retail tool, they could certainly be used to complement energy efficiency methods. According to Planet One Sustainability and the Centre for Design (2003: 20), while there is no guarantee that peak generation of solar or wind power will occur at the same time as peak demand, renewable energy use is still an important part of the equation. This is because it not only improves reliable supply but also has important public relations benefits and emphasises the significance of human-induced climate change as a high profile environmental issue. Also, conspicuously placed renewable energies have the ability to draw shoppers to the mall for sheer ‘gimmick value’.
Improvements in renewable technologies mean that even small on-site turbines can now be grid-connected with the aid of a frequency converter, and considering the large areas of flat-topped roof space offered by Eikestad Mall, the potential for wind turbine installation is substantial (Mertens & de Vries, 2008). However, it might take some effort to convince the Stellenbosch Aesthetics Committee of the worth of this idea. But who knows, maybe Eikestad Mall will present an opportunity to showcase particular South Africa contributions to renewable technologies – including the Thin Film Nano Solar technology developed by Professor Vivian Alberts of the University of Johannesburg (Jager-Waldau, 2008: 118). Engineering students studying at the University of Stellenbosch would likely also significantly benefit through gaining practical experience in the installation and energy metering of renewable technologies.

7.4 Transport

Transport clauses within the Australian Green Star retail tool (GBCA, 2008) include minimising the provision of car parking (at least 25% lower than the maximum local planning allowances), encouraging developments that facilitate the use of bicycles and mass transport by occupants and visitors, and promoting fuel-efficient transport. Here it is stipulated that a minimum of 5% of parking should be reserved for car-pool, car-share and hybrid vehicles, and that another 5% be reserved solely for mopeds, scooters and motorbikes.

Many case studies, particularly within Europe, have demonstrated that it is possible to substantially reduce car usage in city districts coupled with a noticeably higher quality of life. In Vauban, a district in Freiburg, Germany, ‘car-free’ living was supported through allowing cars into the residential area only for pick-up and delivery, with private cars otherwise parked in a car park at the periphery of the residential area (Scheuerer, 2000: 4). A car sharing company was established and a special mobility package developed for members of this organisation. Scheuerer (2000: 4) describes how these residents “not only have access to the shared cars but also receive a one-year free pass for all public transportation within Freiburg.”

While these measures might seem out of reach for Stellenbosch as a whole, a noble shift towards ‘car-free’ living should be supported by Eikestad Mall through a petition for the complete pedestrianisation of Andringa Street. Despite the numerous one-way streets within the vicinity, with the construction of the parking garage near Eikestad Mall and a reduction in the number of ‘circling’ cars, there should be no real reason
why Andringa could not be pedestrianised. Retractable bollards will allow apartment residents and delivery vans into the street, and attempts could be made to establish a car sharing company or car pool club for local residents and office employees alike.

7.5 Water

By far the cheapest option here is the installation of water saving fixtures in toilets, taps and showers as opposed to water capture, storage and recycling infrastructure (Planet One Sustainability and the Centre for Design, 2003: 11). Thus the Green Star SA office rating tool (GBCSA, 2008) rewards efforts which aim to reduce potable water consumption by building occupants and landscape irrigation, and which seek to monitor and manage water consumption through better systems design.

For a start Eikestad Mall might consider switching to low pressure faucets as well as the dual-flush technique marketed by Geberit since 1996 (Geberit, 2007: 31). Because flushing can be with a large (6 liters) or small quantity (3 liters), the water-saving potential is significant. Geberit’s 1-liter urinals with electronically triggered flushing and water-less urinals with odour traps are also new developments with positive effects on water consumption (Geberit, 2007: 31). Considering the fact that currently 300 000 to 400 000 visit the Eikestad Ster-Kinekor cinema every year, and that very likely around 75% of this population make use of the cinema toilets, a switch from the 6 litre flush toilets to the dual-flush toilets and waterless urinals could very well mean water savings of around 37,5% (i.e. 1125 000 litres versus 1800 000 litres per year).

Further water reductions can be achieved through vacuum technology as has long been used on ships, aeroplanes and trains. Vacuum technology is suited for serving larger populations of people within built-up areas, and can even be combined with a biogas system. Here two birds can be killed with one stone – the need to conserve water as well as relieve the pressure on Stellenbosch’s sewage treatment plant. The vacuum-biogas system was first piloted in a housing settlement of 350 people in Lubeck, Germany, and involves the anaerobic treatment with co-treatment of organic waste within a semi-centralised biogas digester (Otterpohl, 2000: 9-10). Excess sludge is converted into fertiliser and taken by truck to a local farm, while the biogas could well be used to produce methane for cooking and lighting within one of the malls many eateries (Otterpohl, 2000: 10). Decentralised treatment of grey water will
also mean that water can be recycled and reused for irrigation or toilet flushing purposes.

The large areas of roof space offered by Eikestad mall and surrounding buildings are wonderfully suited for rain water harvesting. While the biggest capital investment here will be the water storage tanks, the guttering system can likely be obtained fairly cheaply or at least manufactured locally (Technical Note, 2005: 3).

8. Community Building through use of public spaces

Although this aspect remains conspicuously missing within both the Australian Green Star retail tool as well as the Green Star SA rating tool for office buildings, it nevertheless remains an important feature within the holistic approach supported by green design, capable of enhancing both civic pride and community participation. The questions here would be: what added value can the Eikestad Urban Renewal Project bring to the community of Stellenbosch as a whole? How can society be ‘renewed’ through this initiative? What measures can be taken to help bring together a much divided community as well as ensure that all racial groups benefit? How can a distinctly South African culture be promoted through use of public spaces or how can public spaces enhance Stellenbosch’s unique identity? These questions require much more thought than has been given to them here, and while I cannot pretend to have all the answers, the following represents a few ideas for community building:

- Shared public experience

Over and beyond the current plans for Eikestad Mall, mixed-use outdoor spaces, such as the Beyers Street Passage and the pedestrianised Andringa Street, can be used to bring Stellenbosch residents together for celebrations, events, activities and programmes. These spaces hold much potential for art exhibitions, live music and even a Saturday morning market. In fact, in Johannesburg a number of markets operate from shopping mall car parks, with possibly the most well-known one being the rooftop market at the Mall of Rosebank.
Materials: There is no doubt that poor judgement in choice of buildings materials not only consumes large amounts of energy and has major environmental impacts, but can also affect the health and sometimes safety of occupants (Edwards, 1999: 121). Thus one of the themes of this category has to do with rewarding designs that produce a net reduction in the total amount of materials used. The Green Star SA office rating tool (GBCSA, 2008) recognises buildings which reuse existing structures and materials to minimise material consumption, as well as those that have achieved reductions in the use of Poly Vinyl Chloride (PVC) products. The use of reused timber, the only green structural material in existence, is also encouraged as is the use of timber that has been certified as having undergone environmentally-responsible forest management practices. Predictably, designs which incorporate much Portland cement and virgin steel (two resources containing substantial amounts of embodied energy), are discouraged.

Although the baking and transportation of bricks consumes large amounts of energy, bricks have the added advantage of offering an attractive and durable low-maintenance finish (Edwards, 1999: 122). And in the case of the fairly extensive refurbishments taking place at Eikestad Mall, while recognition is given to the fact that local Corobrick bricks have been used, Eikestad would be advised to also consider recycling old bricks. Recycled bricks can be used as ground surfacing for the Beyers Street passage and Andringa Street, while the potential also exists to recycle floor tiles as well as any possible steel or aluminium fixtures.

Within the new exterior design of Eikestad aluminium will be used extensively to simulate wood. Because aluminium is a high energy producing material the recommendation here would be that recycled aluminium be sought. Alternatively, hardwoods such as oak or beech could be used as a replacement for aluminium. However, case studies in Australia have shown that recycled aluminium and high quality hardwood are not easy to come by, and sometimes even have to be imported (Robinson, 2007: 2). This in itself is counter-productive in reducing the energy consumption of buildings. Thus where recycled materials can not be sourced within the country Eikestad should work together with the CSIR in ensuring that materials are designed for disassembly.

Land use and ecology: Here points are given by the Australian Green Star retail rating tool (GBCSA, 2008) for developments which occur on land that has limited ecological value, or land which has previously been developed and is still within the existing municipal boundary. Also, practices which preserve the ecological integrity of topsoil and which enhance the ecological value of the site are highly rewarded.

Because Eikestad represents a refurbishment as opposed to a new development it could well score fairly highly in this category. However, ‘green roof architecture’ should also be considered. Here plants with high sequestration value are planted on rooftops to offset CO2 emissions as well as lower temperatures within buildings. As with the incorporation of renewable technologies, the branding and public relations benefits alone could likely tip the scales in favour of green roof architecture.

Innovation: Both the SA office tool and the Australian retail tool promote pioneering initiatives in sustainable design, processes and advocacy, as well as projects that achieve environmental success in excess of the current Green Star rating benchmarks (GBCSA, 2009; GBCA, 2008). Innovation need not necessarily mean introducing something completely new or previously undiscovered. It can also, for instance, refer to the end-product of something that has been made, installed or introduced through processes that required initiative as well as creativity and strategic thinking (Higgins & Morgan, 2000: 121). Thus an idea might be for Eikestad Mall to partnership with Sainsbury in introducing Africa’s first car-triggered kinetic plates, or alternatively to include hemp as reinforcement within fibre-strengthen concrete mixtures. Neither of these ideas could purport to be ‘new’, but both would certainly be considered innovative within the context of green retail in South Africa.
Buskers of the variety found in many European cities, such as La Rambla in Barcelona, could be brought on board to entertain the crowds passing through Andringa Street and the Beyers Street passage. These spaces could also form the core area of a possible ‘Stellenbosch Winter Festival’. Such activities will promote cultural expression and community interaction – adding life to the town centre (Planet One Sustainability and the Centre for Design. 2003: 24). A conference room within the mall could also be made available as a meeting place for local organisations and NGOs. What is important here is that public spaces are inclusive of all ages, abilities and people groups (Pfundt, 2009).

- **Design**

Through design Adringa Street could become fully pedestrianised. Also, landscaping elements could be added to the outdoor public spaces of the Eikestad Urban Renewal Project, as could benches, seating walls and better signage.

- **Communication and participation**

Communication that is regular and frequent, establishing an on-going conversation with both local government and community members can help to create an inclusive ‘brand’ and promote mutual cooperation and understanding. Strong public participation should particularly be engaged in creating a shared vision for mixed-use outdoor spaces, over and above the forms of consultation required by local building regulations. As an innovative idea, the design of the outdoor spaces of Eikestad Mall could even be opened up to a town design competition, as was the case in Redmond, UK (see Pfundt, 2008).

9. **Comparing the current refurbishment with a sustainable alternative**

Using the sustainability rating and principles of the ‘Seven Senses’ developed by Stellenbosch's Sustainability Institute, a visual comparison was made between the current Eikestad Urban Renewal Project and the more holistic sustainable alternative represented above by means of the given recommendations. See Figures 1 and 2.
Figure 1: Sustainability rating of current refurbishment

Figure 2: Sustainability rating of ecological alternative taking into account above recommendations
10. Conclusion

Within Part A of this paper I argued for the necessity of ecological design, and concluded by stating that the time is right in South Africa for the advancement of ecological design within the retail sector. Within Part B this paper an argument has been made for the appropriate design of shopping malls particular to the needs of a divided South African society. Here a holistic form of eco-design is seen as not only offering ecological and economic solutions, but as also offering a tool in helping to heal the wounds of the past. In this way the Eikestad Urban Renewal Project is viewed as a missed opportunity. My hope for the future is that sustainability with its 'evolutionary undercurrent' be used to promote a more “historically attuned approach to people, landscapes and spaces of interaction” in which “ecologically conscious design can provide a culturally resonant approach to weave the knowledge, pain and heroism of the past into the present as seamless tapestries of the new identities that are being made and remade in the sustainable, cultural and inclusive city” (Pieterse, 2006: 299).
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