con-
clusion

This dissertation has offered me the opportunity to develop a sense of ownership, being part and partial of the twenty-first post-carbon society, exposed to the energy crises and the recent fall of the global economy, one realize how vulnerable our human nature is within the greater scheme of things. We have evolved into a society, knowing no alternative to fossil fueled energy. A frightening reality with no instant remedy , something we have to face now and in the near future. However, to contribute to this cause, revealing the significance of the crises, and aiming to change opinions, we can steer society into a resource efficient direction.

Green architecture, offers many solutions, backed by several theories and loaded with opinions. However, the trick to successful sustainable living, lies in the efficient conveying of the 'green' message to the target market. To become acquainted with this knowledge field and as designers, aiming to alter perceptions, conform to the know-how and the will to transform towards a 'greener' society. The dissertation aim to investigate the possibility to create a learning facility, with a carbon minus footprint [to produce more energy than what is used]. The conclusion; its a possible but quite difficult mark to achieve. For the facility to act as an awareness component, functioning as a facilitator of social sustainability and offer the opportunity to grow towards futuristic buildings with a carbon minus footprint, is well in our grasp. Therefor, a facility of this nature, could be effective and sustainale to a certain extent towards its cause.

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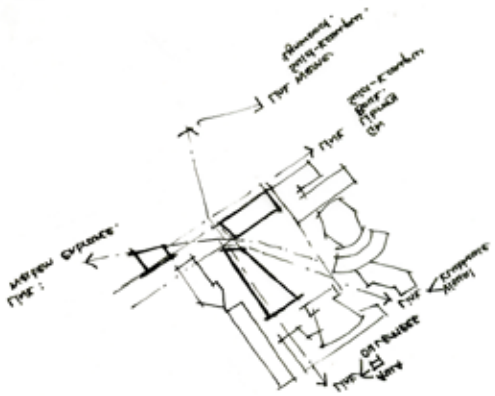
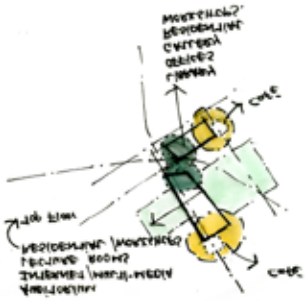
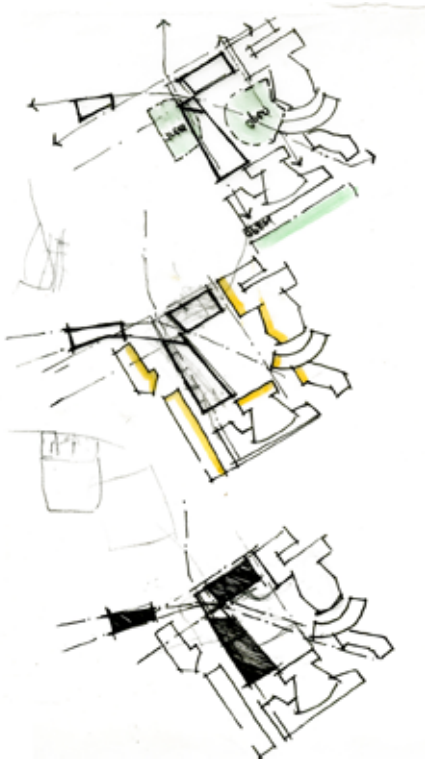
appendix







The research precinct - group framework:

ı Permeability move and connect
ı Vitality exciting places
ı Variety diversity 'the spice of life'
ı Legibility where am I? How do I get there?
ı Robustness change and adapt as required

Good qualities in urban design are achieved through urban design principles

Permeability - A desirable characteristic of a place is the ease with which one can move through and get to other locations. Such places are therefore integrated physically or connected to their surrounding areas.

Vitality - Places that are vibrant, safe, comfortable, varied, fun, and active.

Variety - A successful place also offers a mix of activities to the widest range of possible users.

Legibility - A successful and legible development is a place that has a clear image and is easy to understand.(Lynch)

Robustness - A desirable quality of a development is to create a place which can be used for many different purposes by different people and can change and adapt for different uses.

Rules:
Urban design qualities are abstract theoretical concepts. Designing to ensure the inclusion of a particular quality means adopting some kind of rule or 'urban design

principle'.
When applying design principles to a particular part of town we must always place them in the broader context of that town.
The principles are not rigid and are not to be followed slavishly. In real situations some may have to be adjusted in order to benefit the largest number of

people.
Good design results from a consideration of the widest range of concerns and

issues - imaginative, creative resolution of potential conflicts.

Successful streets, spaces, villages, towns and cities tend to have qualities in common. The fundamental qualities of successful places, which all development must contribute to, are outlined below.

1 Character
Sense of place and history
A place that responds to and reinforces locally distinctive patterns of development and landscape
• Distinctive landscapes
• Natural features
• Locally distinctive buildings
• Streets and street patterns
• Special spaces
• Skylines and roofscapes
• Building materials
• Local culture and traditions
• Avoiding standard solutions

2Continuity and enclosure
Clarity of form
A place where public and private space are clearly distinguished
• Streets, footpaths and open spaces overlooked by buildings
• Clear distinction between public and private space
• Avoiding gaps in the line of buildings
• Enclosing streets and other spaces by buildings and trees of a scale that feels comfortable and appropriate to the character of the space

• No leftover spaces unused and uncared for
3 Quality of the public realm
Sense of wellbeing and amenity
A place with public spaces and routes that are lively and pleasant to use
• A feeling of safety and security
• Uncluttered and easily maintained
• Carefully detailed with integrated public art
• Suited to the needs of everyone, including disabled and elderly people
• Well-designed lighting and street furniture
• Attractive and robust planting
4 Ease of movement
Connectivity and permeability
A place that is easy to get to and move through
• Density highest where access to public transport is best
• Roads, footpaths and public spaces connected into well-used routes

• Easy accessibility
• Direct routes that lead to where people want to go
• A choice of safe, high quality routes
5 Legibility
Ease of understanding
A place that has a clear image and is easy to understand
• Landmarks and focal points

• Views
• Clear and easily navigable routes
• Gateways to particular areas
• Lighting

• Works of art and craft

• Signage and waymarkers

6 Adaptability
Ease of change
A place that can change easily
• Flexible uses
• Possibilities for gradual change
• Buildings and areas adaptable to a variety of present and future uses
• Reuse of important historic buildings

7 Diversity
Ease of choice
A place with variety and mixed uses
• A mix of compatible uses and tenures
• Variety of layout and building form
• Diverse communities and cultures
• Variety of architectural styles
• Biodiversity
The form of development is the physical expression of urban design. It consists of the relationships, shape and size of buildings, structures and spaces. It will influence the user's activity and movement in a place and so is fundamental to the success of a place. The most important elements of development form are listed here. Each of these elements are informed by the seven urban design qualities described in section 01 to create the physical components of a plan.

1 Urban structure
The essential diagram of a place showing:
• The relationship between new development and nature, land form and existing buildings
• The framework of routes and spaces that connect locally and more widely, and the way developments, routes, open spaces and precincts relate to one another
2 Urban grain
The nature and extent of the subdivision of the area into smaller development parcels showing:
• The pattern and scale of streets, blocks and plots
• The rhythm of building frontages along the street as a reflection of the plot subdivision
3 Density and mix
The amount of development and the range of uses this influences, to include:
• The intensity of activity relative
to a place's accessibility
• The place's vitality relative to the

proximity and range of use**S**
• The development's viability
4 Height and massing
The scale of a building in relation to:
• The arrangement, volume and shape of a building or group of buildings in relation to other buildings and spaces

• The size of parts of a building and its details, particularly in relation to the size of a person
• The impact on views, vistas and skylines
5 Building type
• The size of the building floorplate its storey heights and means and location of access
• The relationship of the building toadjacent buildings and how it relates to external space at ground floor level
• The nature and extent of the building's setback at upper floors and roof treatment
6 Facade and interface
The relationship of the building to the street:
• The rhythm, pattern and harmony of its openings relative to its enclosure
• The nature of the setback, boundary treatment and its frontage condition at street level
• The architectural expression of its entrances, corners, roofscape and projections
7 Details and materials
The appearance of the building in relation to:
• The art, craftsmanship, building techniques and detail of the various building components true to local context
• The texture, colour, pattern, durability and treatment of its materials
• Materials sourced from local and/or sustainable sources, including recycled materials where possible
• The lighting, signage and treatment of shopfronts, entrances and building security
8 Streetscape and landscape
The design of route and spaces, their microclimate, ecology and biodiversity to include:

• Paving, planting and street furniture
• The integration of public art, lighting, signing and waymarkers
• The treatment of parks, play areas, natural features and recreation areas
• Consideration of long term management and maintenance issues
Case Study

CHARACTER
Transforming the image and perceptions of a stigmatised estate by adopting characteristics of the surrounding terraces but without stylistic pastiche.

CONTINUITY
AND ENCLOSURE
Legible block and street-based layout enclosed by vertically proportioned modern terraces.

QUALITY OF THE
PUBLIC REALM
Positive public spaces faced by buildings, greater public safety and security, new five-a-side pitch.

EASE OF MOVEMENT
New route created across the estate linking to bus services and school, interconnecting network of streets and mews providing a choice of routes.

LEGIBILITY
Corners and mews access are given architectural emphasis, there is a clear and easily understandable grid of streets that are better connected into the surrounding street pattern.

ADAPTABILITY
Existing buildings have been adapted to introduce new uses and provide modern accommodation standards. All homes are designed to Lifetime Homes standard to facilitate future adaptation to residents' needs.

DIVERSITY
New development provides a mix of residential tenure and introduces new commercial and community uses.

CAA Commonwealth Association of Architects

An Architect's Guide to Designing for Sustainability

A Joint Commonwealth Foundation/Commonwealth Association of Architects Developmental Study

Prepared by:
CSIR
Built Environment Unit
Pretoria
South Africa
November 2006

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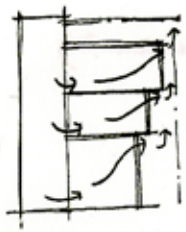
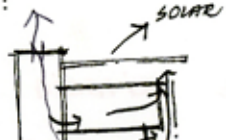
PO Box 580 Edgware HA8 9HZ United Kingdom
Tel/Fax: 44 20 8907 9089

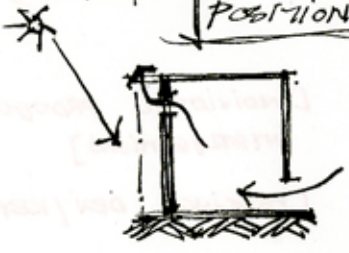
VENTILATION OPTIONS :

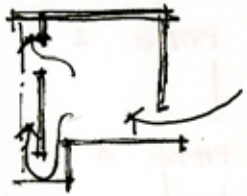




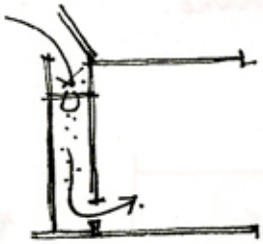
SCREEN OPENING.

POSITIONING OF OPENINGS NB!!



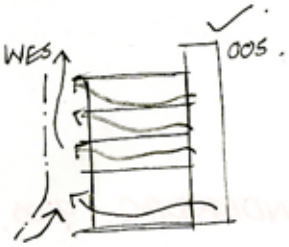


TROMBE WALL THERMAL SYSTEM.

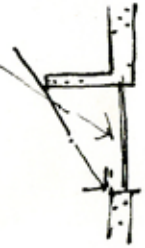


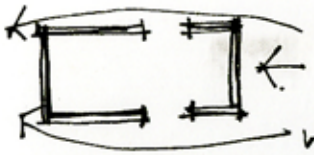
WIND SCOOP. [combination of wind speed/ evaporative cooling]

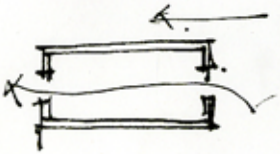
SECTION:



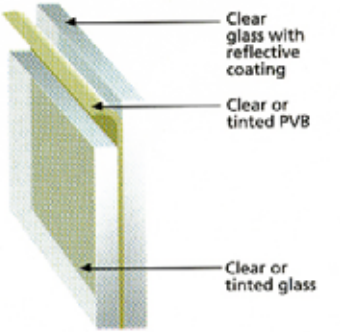
NORTH :

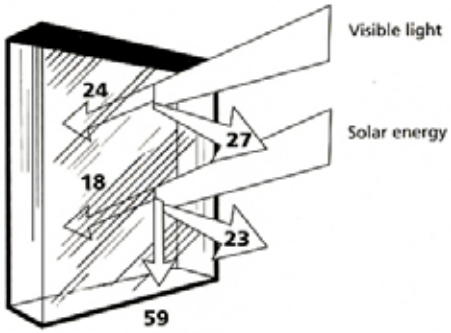






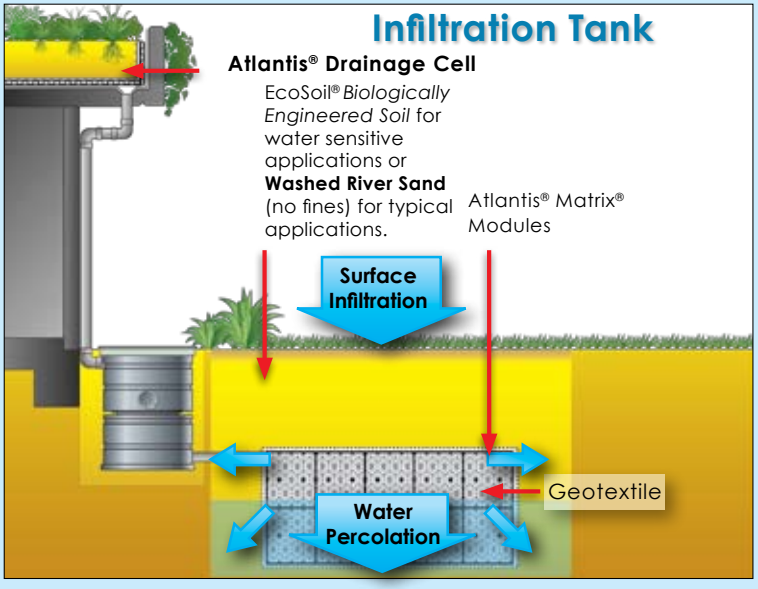
PLAN:





Solarshield S20 Silver

Atlantis® Matrix® Modules



The infiltration tank system is the ideal way to manage stormwater runoff in permeable or semi-permeable soil conditions.

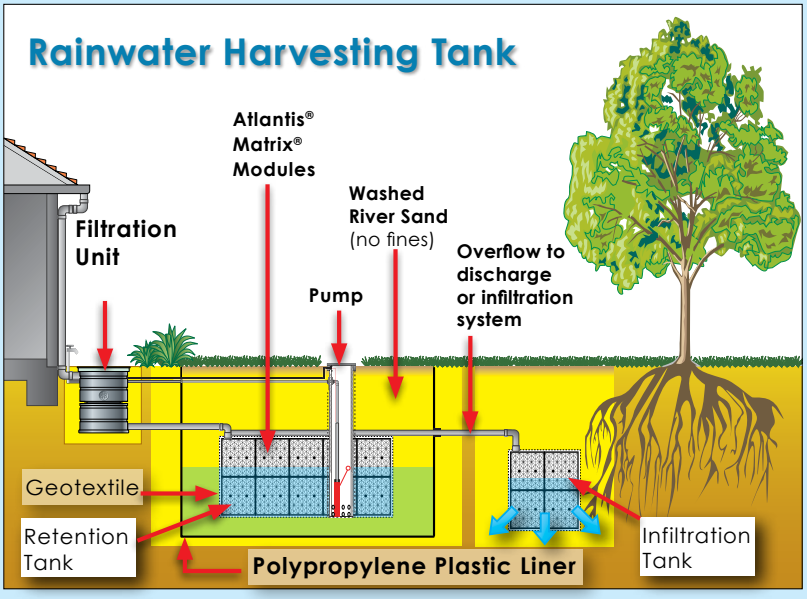
How It Works!
The system is designed to capture surface water through infiltration, and then clean and filter the water before it is allowed to recharge the water table providing moisture for surrounding vegetation.

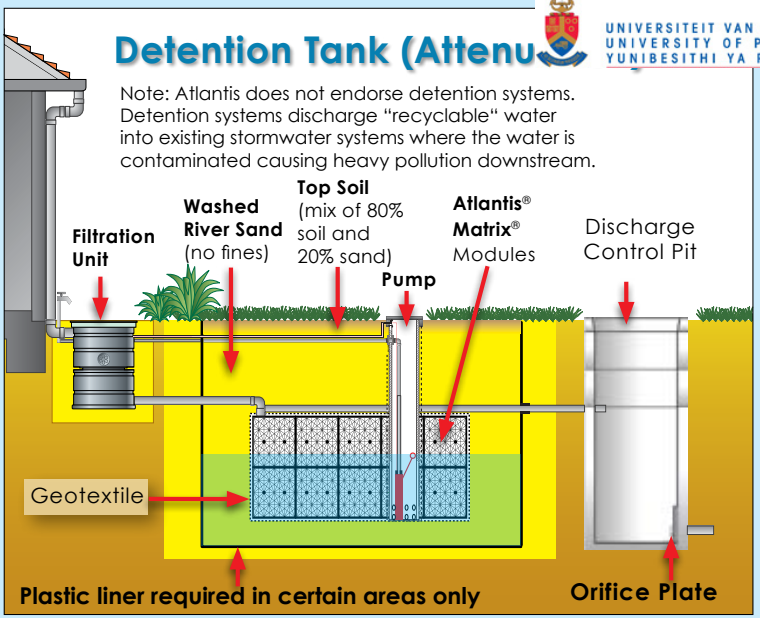
Applications: New developments required to meet water sensitive urban design standards.

The **Atlantis® Re-use System** has proven effective in providing a regular clean water supply for domestic and commercial applications.

How It Works!
The system captures water from both landscaped areas through surface infiltration and from roof areas. Clean water is retained within the storage area away from harmful U.V. light and heat remaining cool underground readily available for re-use.

Applications: Typical applications include flushing toilets, in washing machines, watering gardens and washing cars.



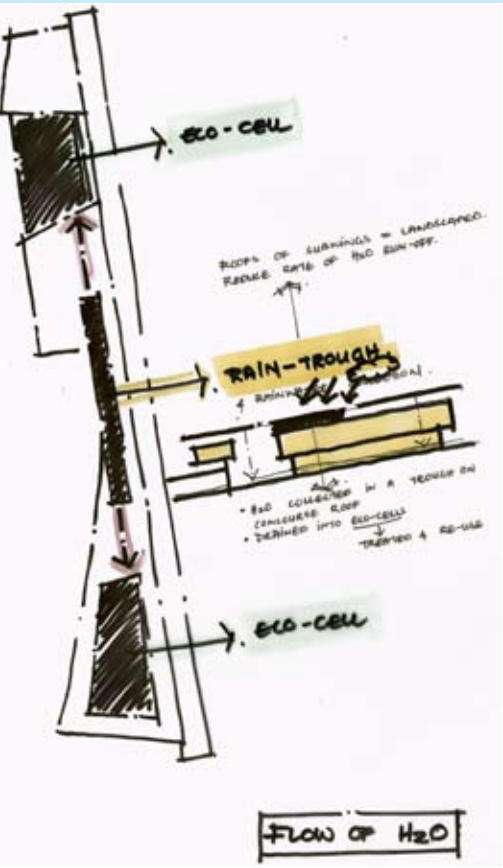


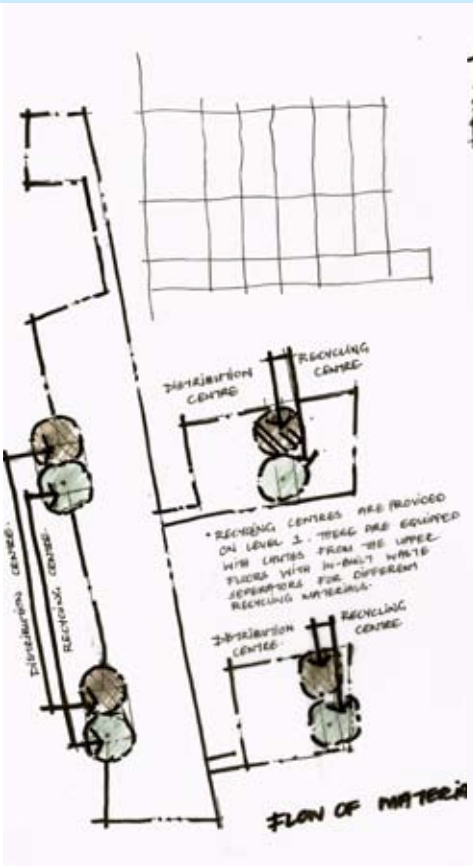
The system offers flexible design options, saving installation time and delays to site access.

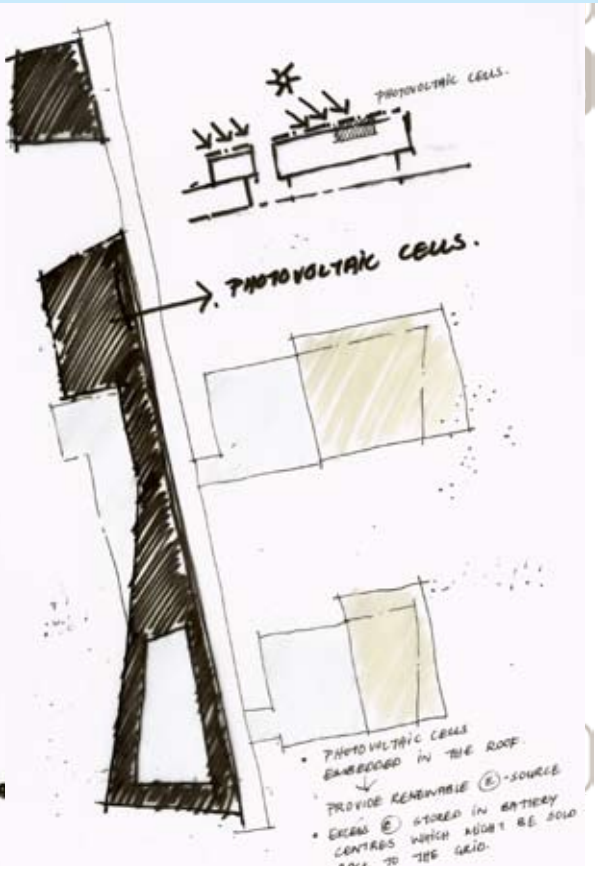
How It Works!
Water captured from roof and paved areas are filtered before entering the storage area (Atlantis® Matrix® Modules). Water is then slowly released through the discharge control unit (DCU).

Applications: Developments that need to meet Local Council Stormwater requirements.

Note: Atlantis **does not endorse** detention systems. Detention systems discharge "recyclable" water into existing stormwater systems where the water is contaminated causing heavy pollution downstream.







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GE
Water & Process Technologies
ZENON Membrane Solutions

ZeeWeed packaged plants provide large-scale performance in a compact pre-assembled system

Packaged Plants for Water and Wastewater Treatment

Incorporating a simple and expandable building-block design, ZENON packaged plants can be quickly set up in virtually any location and feature scalable treatment capacity that can be increased as demand grows. These highly automated, plug-and-play UF systems outperform conventional treatment alternatives in all categories, offering superior treated water quality that meets or exceeds regulatory requirements, reduced operating costs, smaller plant footprints, and highly reliable performance—at a price that is comparable to conventional systems.

Pre-assembled and factory tested systems offer:

- Reduced on-site construction costs with less interconnecting requirements;
- Quick delivery with complete engineering package already completed;
- Cost-effective solutions for virtually all water and wastewater treatment applications;
- Comprehensive cleaning capability for peak system performance;

Municipal Drinking Water
Township of Tay, ON - 70,000 gpd (265 m³/d)
Z-BOX M

Municipal Wastewate
Huntsville, TN - 300,000 g
Packaged Equipment Skid

Innovative louvre system facilitates energy efficiency

The Green House in Parkwood, Johannesburg, has been designed by Enrico Daffonchio of Daffonchio & Associates Architects. The building serves as the head office of McNab's and boasts a custom-made, sun-protecting louvre system to control the indoor climate. So effective is this sunscreen system that the building does not need any energy-intensive air-conditioners.

In a departure from the normal notion of facing a building north, the façades of the Green House face mostly east and west in order to exploit the natural heat of the sun for indoor heating. The building also boasts an underfloor heating system making use of solar panels on the roof.

According to Daffonchio, the green building design approach focused on three aspects: energy consumption, water consumption and choice of materials. "The correct combination of these three elements enables an architect to reduce the carbon footprint of a building", he tells *Urban Green File*.

Rupert McKerron, CEO of McNab's tells *Urban Green File*, although the building is visually appealing and innovative, the basic structure is actually quite simple and inexpensive. "We have saved money on the structure and this allowed us to spend on technology, such as the sunscreen louvre system."

— An in-depth feature article on this building will be published in the August 2008 edition of Urban Green File.

Gerald Garner

Rupert McKerron of McNab's (left) and architect Enrico Daffonchio at the Jozi O Green House. The building boasts innovative sunscreens on the northern façade (pictured) and a louvre system on the eastern and western façades.

- Simple and highly automated operation and in-situ membrane cleaning;
- Modular building-block design;
- Simplified start up with minimal installation time;
- Compact footprint with flexible layout options;
- Greenfield or retrofit solutions.

r Treatment
pd (2,136 m³/d) ADF*
s Z-MOD L

Decentralized Treatment
Office Park, Oakville, ON - 17,500 gpd (66 m³/d) ADF*
Z-MOD S

Dr. Ian Erasmus
Tandarts
Dental Surgeon
Oral Hygienist available for cleaning
Nooddienste beskikbaar
Tel: (012) 343 0300
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13October2008 year70issue17

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UP destroys 130 trees a month on paper.

Photo: Arthur Horn

Environmentally unfriendly

ARTHUR HORN

One of the most essential pieces of equipment for the survival of a student is a photocopying machine, the beast of equipment churning out sheet after sheet for tests and assignments. But do we think of the effects of our mass-reproducing ways? And is the use of paper on campus reduced where possible for the sake of our environment rather than our pockets?

Apparently not. According to Otto Trollip of the library's Minolta branch, Minolta at Tuks use more than 2200 reams of paper per month. This means that, at 500 sheets of paper per ream, over a million sheets are used per month. The university has no recycling programme to compensate for its large usage, but Trollip states that he gives paper that has already been printed on to students for scrap and study purposes.

Black and white photocopies cost 29c each at the library, the smallest photocopying-fee that Minolta charges. Following from that, students spend a minimum of R319 000 on paper per month, though the actual figure is higher. And as expensive as that may be, the cost on the environment is far greater. A single tree can provide between 16 and 17 reams of typical office paper. At its current rate, campus Minolta alone is responsible for the destruction of 130 trees, all for printing and photocopying.

Local company Remade Recycling supplies recyclable materials to the Sappi Waste Paper group. According to Francois Marais, the manager of Remade Recycling's Pretoria branch, the company was approached by Tuks several months ago to help clean up the office areas at Tuks. Though this is not a service provided by Remade Recycling, it is encouraging that the university is pursuing possible avenues for waste reduction. However, Marais advises that if the university decides to seriously pursue paper-recycling on campus, they will need to set up various collection points which companies could use. In recent months, several of these collection points have indeed appeared on campus, though whether these are enough to combat the enormous amounts of paper wastage by photocopying students is debatable.

Jan Reynecke, Advisor to the Principal, has previously told *Perdeby* that the library is moving away from buying books, and focusing instead on electronic journals in the interest of cutting costs and saving paper. This may save the library money, but does little other than boost the printing requirements of students. And with a million sheets of paper leaving campus every month and no centralised recycling plan on campus to curb wastage, it is a problem the university needs to start considering more seriously.

[an article from the local campus newspaper]

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