



Hotel Verde sustainability overview

After just over two years of hard work and dedication, Hotel Verde officially opened on 27 August 2013. The firm intention of the entire project team, spear headed by the client's conviction and passion, throughout all the planning and work, was to make it an utmost sustainable project. So much so that we are now *Africa's Greenest Hotel*.

In May 2014, Hotel Verde achieved LEED Platinum for new construction. This made Hotel Verde the first LEED platinum hotel in Africa and the sixth in the entire world. LEED (Leadership in Energy and Environmental design) is an internationally recognised green building rating and certification system. This system, developed by the USGBC (United States Green Building Council) and administered and audited by the GBCI (Green Building Certification Institute), provides third party verification that a building was designed and built to be sustainable. Sustainable in this sense refers to a comprehensive list of factors including, but not limited to, energy savings, water efficiency, CO₂ and other greenhouse and harmful gas emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

During the development of Hotel Verde several considerations, active and passive designs, technologies and equipment were included into the design of the building. These range from the simple and obvious like recycling during construction, via passive designs like natural ventilation and night cooling to technically demanding and complex installations of equipment like photovoltaic panels, wind turbines and a grey water recycling plant. Other installations bound to have a huge impact on sustainability include an active intelligent building management system controlling the super-efficient heating, air-conditioning and ventilation system. An efficient system like this is of little value if the building is not thoroughly insulated; Hotel Verde has insulated roofs and doors as well as double-glazed and spectrally selective windows as well as air tight windows and doors. These are but a few examples of the more comprehensive list overleaf.

In 2014, Hotel Verde also became the first hotel in Africa to offer accommodation and conferencing that is 100% carbon neutral. In addition, the hotel received platinum certification from the Heritage Environmental Management Programme for its meaningful environmental management system. Also the first to bring many other sustainable innovations and achievements to Africa, the hotel runs at 70% more energy efficient than any other Cape Town hotel¹ and has won many awards for its green features and water and energy saving technologies.

¹ According to a 2008 study

Hotel Verde's Awards:

- Save, the Energy Efficiency Forum for Commercial Buildings – Winner 2013
- South Africa Business Premier Awards – Finalist and winner of the Green Award – 2014
- Eco-Logic Awards (by Enviropaedia) – Water Category, Winner 2013
- Internorga – Trendsetter Category, Winner 2014
- Sanea Energy Awards – Energy Project Category, Winner 2014
- Eco-Logic Awards (by Enviropaedia) – Energy Saving Category, Winner 2014
- Lilizela Tourism Award 2014
- WTM 2014 (World Tourism Market), Responsible Tourism Awards, Winner for Best City Hotel, 2014
- Trip advisor – Traveller's choice award (top 1% of hotels on Trip Advisor)

The owners have been committed to operating the hotel in a sustainable fashion right from the start. With this commitment having been made so early on it has allowed the operational structure to be thoroughly planned and the design of the building and its systems optimised to facilitate this. This will be substantiated by the project pursuing LEED for Existing Buildings and Green Star for Existing Building Performance.

With Ecolution Consulting, our dedicated sustainability consultants, who partnered with Ecocentric on the LEED certification and all other professionals convinced and passionate about this drive it was inevitable that the goal of becoming *Africa's greenest hotel* would be achieved.

Approximately R20m additional capital expenditure (represents 14.5% of the development budget) was incurred for the sustainability interventions throughout the design and construction phase including all technical equipment/systems that would not be found in a standard (read non green) comparable hotel.

Payback calculations for the entire additional capex is difficult as there are many difficult to quantify benefits (over and above the easier energy, water and sewer bill savings) such as: 1. waste bill reduction; 2. reduced absenteeism; 3. increased productivity; 4. Increased room bill (as well as restaurant, meeting room and bar prices); 5. significantly increased PR exposure and free marketing in various forms of media (in excess of R7.5million average exposure value in the first 4 months since August 2013, official opening month of Hotel Verde and an average of R30 million to date).

Some interventions such as the wind turbines are not simply a business decision. In this case, their payback period based purely on energy savings is in the region of 18 years. However, by being right in front of the reception they make a bold statement that Hotel Verde is a green hotel; they state that Hotel Verde supports the wind power industry and believes that it (at a larger scale) is part of the solution to our national (and global) energy crisis and the wind turbine masts also hold up the tensile tent porte - cochère, thus avoiding the need for additional masts.

Design & Construction

Building practices and passive design

Waste Management

- Waste reduction
- Recycling
- Re-use
- Hazardous material reduction (Portland cement, Volatile Organic Compounds)

Responsible Stewardship of Materials and Resources

- Dematerialisation
 - Use of Cobiax void formers in concrete slabs
- Eco friendly or rapidly renewable materials and products as far as available and feasible, for example:
 - carpets
 - paints
 - counter tops
 - wooden doors
 - plaster
 - decorations
- 50% of construction materials sourced locally to reduce transport

Energy Efficiency in Passive Building Design

- Thermally (and acoustically) well insulated structure and services
 - double glazed windows
 - spectrally selective windows
 - insulated roof
 - roof has high SRI (Solar Reflectance Index)
 - insulated ductwork and piping
- Airtight windows, doors, entrances to minimise losses of conditioned air
- Northern facing windows shaded by photovoltaic panels
- Natural ventilation in strategic areas
- Utilising indirect sunlight for lighting, esp. for corridors, lobby and other general areas
- Utilising light interior colours to increase light penetration
- Skylight for natural lighting
- Green Roof
 - Provides improved insulation
 - Reduced heat island effect
- Living wall
- Tiered building for sectional occupation for complete shutdown of unused tiers
- Strategic filling of more efficient rooms

Water Conservation in Passive Building Design

- Low-flow fittings
- Dual flush toilets
- Waterless urinals
- 'Drip' irrigation systems
- Only selected rooms have baths

Active systems / technical installations

Renewable Energy and Energy Generation

- Three vertical-axis wind turbines
- Photovoltaic panels on North facing roof and façade
- Energy generating gym equipment
- Elevators with regenerative braking

Energy Efficiency in active systems / technical installations

- Intelligent Building Management System to actively and continuously optimise efficiency and autonomously report malfunctions or inefficiently running equipment
- Energy efficient and intelligent Heating Ventilation and Air-Conditioning system using geothermal ground loops coupled to heat pumps for central heating/cooling and domestic water
 - Utilising geothermal ground loop technology
 - Utilising heat pump technology
 - Strategic zoning and placing of thermostats
 - Public area demand control ventilation
 - Occupancy controlled ventilation
 - Carbon monoxide monitoring activating additional ventilation in basement only when necessary
- Energy and/or water efficient equipment – Energy Star certified
 - Washing machines which utilise the rinsing water of the last rinse to pre-rinse the next load
 - Dishwashers
 - Lighting (Low voltage bulbs and/or LED lights)
 - Personal Computers
 - Printers
 - Screens
- Motion/Occupancy controlled lighting in e.g. corridors and bathrooms
- Main power isolation switch to each bedroom, office and meeting room
- Demand controlled ventilation to bedrooms

Water Conservation in active systems / technical installations

- Grey water recycling plant (from baths and showers)

To be used for:

- Toilet flushing

- Rain water and subsoil drainage water harvesting

To be used for:

- Irrigation
- Car washing
- Hardscape cleaning
- Aquaponics units

Operating Practises

Waste Management

- Recycling
- Composting
 - Vermicomposting
 - Bokashi Composting

Responsible Use of Resources

- Use of eco-friendly or recycled products sourced mainly locally
 - Eco- friendly soap, dishwashing powder, washing detergents, cleaning agents
- Utilise organic and sustainably cultivated or bred ingredients in our kitchen
- In-house water filtering and bottling
- Small urban farming setup/ vertical garden (Aquaponics)
- Operational Materials Management Plan (OMMP)

Carbon Offsetting

- The already reduced carbon footprint of every guest stay and/or conference venue use is offset through the responsible purchase of carbon credits
- Guests and conference delegates are issued with an accredited certificate to prove that their experience at Hotel Verde was carbon neutral which they can use in their own business records
- The already reduced carbon footprint of the hotel is calculate on an annual basis according to the Greenhouse Gas Protocol (GHG Protocol) and offset through the responsible purchase of carbon credits making Hotel Verde carbon neutral

Social Responsibility and Awareness

- Guest involvement
 - Guests educated through interactive screens and awareness posters
 - Guests encouraged to minimise paper usage (electronic invoices, etc.)
- Guests incentivised to:
 - Re-use towels
 - Minimise air-conditioning usage
 - Use bicycles in gym which feed power into building
 - Jog around on eco-trail
 - Cycle to the hotel
 - Arrive with public transport
 - Arrive with a low emitting/ fuel efficient vehicle
- Green channel on in-house TV
- Weekly 'earth-hour' where non critical equipment and lights are switched off for one hour
- Local community involvement and social upliftment schemes
 - Display & sell local arts and crafts

In-house Lifestyle Changes

- On-going staff training and education
- Staff incentivised to recycle by using recycling rebates for staff functions
- Paperless office operation as far as possible
- Green team / environmental committee
- Staff participation in waste sorting
- Reducing wastage

- Switch off unused lights and equipment (if not done so automatically)
- Electric shuttles
- Enviro-box
- Guest amenities dispensers
- Book-exchange

Maintenance

- Electricity usage sub-metering, monitoring and optimisation
- Photovoltaic panel cleaning
- Repair leaking fittings immediately

Surrounding Environment

- Neighbouring Wetland
- Beehives on site
- Landscaping & area up-liftment
- Linwabo's and Sinethenba's Garden
- Eco Pool

A Detailed Look at the Sustainable Features of Hotel Verde

Design and Construction

BUILDING PRACTICES AND PASSIVE DESIGN

Waste Management

Waste reduction

During the construction phase of Hotel Verde waste was minimised wherever possible by minimising packaging. Furthermore a waste management company was contracted to manage all waste created on site.

Recycling

All waste taken off site has been recycled where possible. Waste streams are weighed, recorded and monitored so that progress can be tracked.

A significant portion of the concrete used in construction contains pre-consumer recycled material in the form of slag and fly-ash.

Re-use

In many instances materials that would otherwise have been discarded were able to be re-used on site for other applications. Rubble waste produced on site was used elsewhere as backfill where needed and rubble and tile offcuts were used as a filler for the gabion wall. Wood from shipping pallets used for transporting equipment to the site was reused to make a table.

Hazardous material reduction

All products used on site throughout construction were first screened to ensure that their VOC (Volatile Organic Compound) levels were low enough to meet the LEED rating system requirements. Conventional Portland cement is a hazard substance and was reduced on site through the use of pre-consumer recycled products including fly-ash and slag as an alternative. When cement was mixed on site it was mixed in metal containers or on wooden boards so as to prevent any cement seeping down and entering the ground water.

Responsible Stewardship of Materials and Resources

Dematerialisation

1279 tons or 553m³ of concrete was saved by introducing approx. 46 800 cobiax void formers into the main slabs. Cobiax void formers are hollow balls made from recycled plastic. The balls are introduced into the concrete slabs to both reduce the weight of the slabs as well as save concrete. Having lighter slabs also means that other structural members can be smaller with the spin-off of saving even more concrete.

Eco -friendly or rapidly renewable materials and products

As far as available and feasible, eco-friendly and rapidly renewable materials were sourced in preference over other products. Examples of these included carpets, paints, counter tops, wooden doors, plaster and decorations. Wherever possible, nonindigenous wood was used in preference to indigenous wood.

50% of construction materials sourced locally

By sourcing approx. 50% of the construction materials within an 800km radius of the site a significant amount of damaging environmental impacts related to transport were mitigated.

Energy Efficiency in Passive Building Design

Thermally and acoustically well insulated structure and services

Windows are double glazed for significantly better insulation against heat and sound. Double glazed windows have two layers of glass with dehydrated air in the void in-between that acts as an insulation layer. Windows are also spectrally selective so that they reflect more heat from the sun than conventional windows.

The roof has a multi-layer insulation providing increased insulation as well as a high SRI (Solar Reflectance Index) to reflect more heat away from the building. All heating and ventilation ducts, as well as domestic hot water pipes are insulated in order to prevent heat loss during its journey from the plant to the specific application.

Airtight windows, doors and entrances to minimise losses of conditioned air. By ensuring that the building is airtight the internal conditioned air cannot escape preventing the associated losses in efficiency.

Northern facing windows shaded by photovoltaic panels

The photovoltaic panels mounted on the northern façade of the building double as shading for the windows beneath them and reduce the heat load of the building.

Natural ventilation in strategic areas

In the basement, where conditioned air is not necessary, natural ventilation is used except for when CO levels approach unhealthy levels at which time mechanical extraction fans automatically turn on until the CO levels are again safely low enough. At no point are the CO levels allowed to actually reach unhealthy or dangerous levels.

Utilising indirect sunlight for lighting

In several areas of the hotel natural daylight is harnessed for lighting spaces to save electricity and improve the indoor environment quality. These include some of the corridors and east facing offices and conferencing facilities.

Utilising light interior colours to increase light penetration

By choosing light colours for the décor the need for artificial lighting was reduced.

Skylight for natural lighting

In the reception and lobby area there are 4 large skylights in the roof above allowing a large amount of natural light into the space below and providing sunlight to the living wall.

Green Roof

A portion of the roof was designated as a green roof which means that it is vegetated. The roof is vegetated with indigenous flora from the area. The green roof not only improves the air quality of the surrounding area but also acts as a great form of insulation for the space below and reduces the heat island effect that roofs normally create.

Living wall

In the lobby there is a living wall beneath the sky lights planted with indigenous vegetation. This greatly improves indoor air and environment quality while acting as a beautiful décor feature. The side of the wall that does not see direct sunlight is supplemented with “grow lights” that provide the vegetation with the required spectrum of light frequencies for photosynthesis to occur – this light is on a timer for 8 hours per day to ensure the plants get enough rest.

Tiered building for sectional occupation

Building services were designed and built to be modular such that services in three vertical tiers of the building can be controlled and turned on/off separately. The rooms are then strategically filled tier by tier so that unused tiers can be shut down entirely when not use thereby saving energy.

Strategic filling of more efficient rooms

Advanced building energy modelling was used to establish which rooms are most energy efficient at specific times of the year according to the orientation of the sun the temperature. These rooms are then filled accordingly first before the less efficient rooms.

Water Conservation in Passive Building Design

Low-flow fittings

All fittings throughout the building are “low-flow” allowing the same functionality but saving water by aerating it as it comes out.

Dual flush toilets

All toilets are dual flush allowing users to flush using only amount of water required.

Waterless urinals

Waterless urinals in the building will save close to 1 million litres of water each year.

'Drip' irrigation systems

Drip irrigation systems are installed as opposed to the conventional spray systems that use significantly more water than the former.

Only selected rooms have baths
Only 8 selected suits within the hotel have baths and the rest have showers which use less water.

Active systems/ technical installations

Renewable Energy and Energy Generation

Vertical-axis wind turbines

3 Vertical axis wind turbines decorate the entrance to the hotel, each producing up to 3kW of power towards the needs of the building at 12m/s wind speeds. The turbines generate a combined 10 300 kWh/annum.

Photovoltaic panels on North facing roof and façade

A total of 154 locally produced Tenesol 240Wp photovoltaic modules are installed on the north-facing roof section and a further 66 on the northern façade. Combined this system provides up to 52.8kW and an anticipated production of approx. 89 000 kWh/annum. It is also anticipated that in a typical summer month the system will produce approximately 20% more power than in a typical winter month.

Energy generating gym equipment

The gym is home to 3 different pieces of energy generating equipment, namely a bicycle, a recumbent bicycle and an elliptical machine. Each of these machines displays the amount of instantaneous power being produced by the user and a separate panel displays the cumulative power produced. The power produced is fed into the building grid.

Elevators with regenerative braking

All three elevators in the building have regenerative braking technology which allows them to recover energy on their "light" cycles. If the lift goes up empty the counterweight is heavier than the carriage and the regenerative drive produces electricity for the building. Conversely if the lift goes down with 6.5 or more people inside it is heavier than the counter weight and it will produce electricity for the building. This technology saves up to 30% of the energy that a conventional lift would use.

Energy Efficiency in active systems/ technical installations

Intelligent Building Management System

The intelligent building management system (BMS) continuously receives information from systems, services and sensors throughout the building to actively and continuously optimise efficiency and autonomously report malfunctions or inefficiently running equipment. For example a sensor tells the BMS how bright the sun is and continuously compares this to the amount of energy produced by the photovoltaic cells. If this value drops it shows that the photovoltaic cells are not performing at their optimum efficiency. The BMS then sends a signal to the maintenance team to alert them that the panels require cleaning.

The BMS monitors the consumption of resources such as water and electricity. Sub-metering also means that the maintenance team can see which areas of the building are using the most electricity and see if an area is using more than usual and go and investigate the cause. Other information such as the waste produced on site is also entered into the BMS to be tracked and monitored in order to assess progress and goals.

The information gathered by the BMS is displayed on a screen for the public to see in the main lobby as well as on the in house TV channel. This allows guests to see exactly how much energy the building is using in real time, the amount of energy being produced by the renewable resources, the amount of energy saved through various interventions and more.

Efficient and intelligent Heating Ventilation and Air-Conditioning system

The heating and cooling system in any large building is usually the largest consumer of electricity. Hotel Verde's advanced system achieves extraordinary efficiency using a geothermal loop field coupled to ground source heat pumps for central heating/cooling and domestic water heating.

The geothermal loop field is a closed system and is coupled to four heat pumps that do the active heating and cooling. Because heat pumps run on a refrigeration cycle they both cool on one side and heat on the other. This is similar to a household fridge where the energy from the compartment is extracted, making it cold, and dissipated from the radiator at the back of the fridge (which gets hot).

If both the heating and cooling effect is utilised your efficiency is dramatically increased, as is the case at Hotel Verde. The heating is used for heating both conditioned air for the building as well as the domestic hot water. The cooling side is used for cooling conditioned air.

Unfortunately the hot and cold sides are seldom equally needed; in winter there is a higher heating demand (more and longer showers, more space heating) and in summer mostly a higher cooling demand. This imbalance is what is rectified through the geothermal field.

The ground temperature below the building site is a constant 19.4°C throughout the year while the outdoor temperatures can range from about 3°C to 35°C. The geothermal field consists of 100 boreholes, each approximately 65m deep. Each hole contains a HDPE U-bend pipe. Combined there is approx 13 km of piping beneath the footprint of the building. This intelligent system is able to pass water through these pipes to either dump heat (in summer) or gain heat (in winter) from the constant ground temperature thus using the earth as a thermal battery and gaining significant efficiency.

This system is anticipated to save approx. 50% of the electrical energy that a conventional system would use.

In many of the public areas ventilation is controlled via occupancy sensors or key card readers which only automatically turn on the air conditioning when a room is occupied thus saving unnecessary energy in conditioning an unoccupied room. Thermostats are strategically placed and areas separated into zones to maximise occupancy comfort while minimising energy use.

Energy and/or water efficient equipment – Energy Star certified

The washing machines in the laundry facility utilise the rinsing water of the last rinse to pre-rinse the next load. Wherever possible Energy Star certified equipment is used such as the dishwashers, office computers, printers and screens. Almost every light fitting in the building is fitted with an LED bulb which uses up a tenth of the energy that an equivalent CFL bulb would use.

Motion/Occupancy controlled lighting in e.g. corridors and bathrooms

Lighting in public areas such as bathrooms and corridors as well as most back of house areas and store rooms is controlled by occupancy sensors. This prevents lights from staying on continuously and unnecessarily. Both infrared and ultrasonic occupancy sensors are fitted depending on the application.

Main power isolation switch to each bedroom, office and meeting room

Bedrooms, offices and meeting rooms operate on a key card system. The user is required to insert a key card into the key card reader at the door in order to turn on power to the room and use the lighting, plug points and air conditioning. Conversely when the key card is removed the power to the room is cut preventing unnecessary electricity usage. Certain vital plug points however remain live for things such as refrigerators as well as one plug point at the desk in order for guests to leave personal appliances on charge whilst away from their room.

Demand controlled ventilation to bedrooms

All rooms receive a supply of pre-conditioned air at a comfortable temperature whilst they are occupied in order to discourage guests from over heating/cooling their rooms. If a guests feels that they would prefer to have their room hotter/colder they have the option of turning on the individual fan coil unit in their room and adjusting the temperature, however they forfeit their incentive in doing so.

Water Conservation in active systems/ technical installations

Grey water recycling plant (from baths and showers)

Water from the showers and bath tubs (only 8 of the 145 bedrooms have baths) as well as condensate from the HVAC fan coil units is drained to a state of the art PONTOS grey water recycling plant where it is filtered and sterilized. The recycling process uses very little energy. The water is first filtered to remove macro particles. It is then passed through a series of tanks that are kept at conditions optimal for bacteria by aerating the tanks and providing growth medium (several pieces of sponge) for the bacteria to nucleate around. Once bacteria colonies are of a certain size they start to break down organic matter in the water. This settles as a sludge and is periodically pumped off to sewer. Lastly the water is sterilized by passing it over ultraviolet lights.

The processed grey water is then reticulated throughout the hotel and used for the flushing of the toilets saving up to 6000l per day.

Rain water and subsoil drainage water harvesting

The rainwater from approximately three quarters of the roof is captured and passed through a mechanical Wisy filter before being channelled to an impressive 40,000 litre stainless steel tank in the basement of the building. The basement extends below the water table and so all water that would otherwise want to migrate into the basement is filtered and collected in sumps before it also is pumped into the 40,000 litre tank. This is normal practise but normally this water would be pumped away into storm water and be wasted.

The water from the tank is then used for outdoor uses such as irrigation, car washing and the cleaning of hardscapes. It is also linked to the grey water reticulation system so that rain water can also be used to flush the toilets in the future is desired or if the grey water recycling plant is required to be shut down for maintenance.

Operating Practises

Waste Management

Recycling

All waste produced on site is recycled where possible. Bedrooms have two bins each, one for recyclables and one for other wet waste that cannot be recycled. There are also separate bins in sets of 4 around the building at strategic locations in both the front of house and back of house areas. In each set there is a bin for paper and cardboard, plastic, glass and food waste. Once waste reaches the waste area a designated member of staff sorts the waste into even further waste streams and weighs each stream daily to keep a record.

From this point a waste management contractor collects the waste and sells it to other recyclers. The rebates received for the recyclable material is then used for staff functions as a means of incentivising staff to participate in recycling.

Composting

Food waste is removed by a separate commercial composting company who compost the food waste and sell it as their own product. In the near future efforts will be made to partner with small scale local farming initiatives and donate the food waste to them to compost themselves and use for their farms. A small portion of the food waste is kept and composted on site to provide the compost needed for the hotel's gardens.

The hotel will soon have its own vermicomposting setup otherwise known as worm farming. A small portion of the fresh uncooked plant matter from the kitchen will be fed to the worms to produce vermicast or fertilizer. The vermicast harvested from the worm farm will be used to feed the herbs and vegetables growing in the aquaponics units in the herb garden. The worm farm will be accessible to guests and will be used as a teaching tool for guests and visiting school students to teach them how to start their own farm at home.

Another small portion of the food waste will soon be composted using Bokashi which simply means “*fermented organic matter*” in Japanese. Food is kept in an airtight container and bokashi bran is added in layers which causes the food to ferment without the presence of oxygen rather than rot. This reduces odours and a liquid can be tapped off and used as fertilizer. Once the food has fermented for two weeks it is buried where it takes one month to turn into rich compost. Any food can be composted using bokashi, even meat and cooked food. This will also be used as an education tool on site and demonstrated to visiting school groups and any other guests or visitors than may be interested.

Responsible Use of Resources

Use of eco-friendly or recycled products sourced mainly locally

The cleaning products use in the hotel were carefully sourced to be as environmentally friendly as possible and wherever possible were sourced locally. The guest amenities, dishwashing powder, washing detergents and cleaning agents are all sourced to be as eco-friendly as possible.

Recycled paper is used in many applications within the operation of the hotel such as the business cards and marketing material. The restaurant menus are made using pieces of wood from shipping pallets that were left after equipment and furniture was delivered to the hotel.

Linen, towels and laundry bags are all made from natural renewable materials.

Organic and sustainably cultivated or bred ingredients used in our kitchen

Wherever possible, organic and sustainable ingredients are used in the restaurant kitchen. Partnerships are in development with local small scale farming initiatives to source organic produce and support local business and communities.

In-house water filtering and bottling

Rather than supplying guests with bottled water which has large negative environmental impacts related to the plastic waste produced and the transport of the bottles to and from site, the hotel has its own water filtration and bottling facility. Many times bottled water provided in conferencing facilities is opened and not even finished and then thrown away. We aim to avoid this entirely.

Small urban farming setup/ vertical garden

The hotel has its own small urban farming setup using aquaponics units. The aquaponics units allow plants to be arranged in vertical rows. Water is pumped to the top and flows down over the roots of the plants carrying the nutrients required by the plants.

Operational Materials Management Plan (OMMP)

Hotel Verde has in place a operational materials management plan OMMP, which outlines the way in which we go about procurement practices. It has the following guidelines:

1. Better for the guest

Through more responsible and caring sourcing of our products we can offer guests:

- Hypo-allergenic linen
- Bathroom amenities are specially created to have ingredients that are not harmful to our guests or the environment.
- Fair Trade coffee in biodegradable packaging
- Improved environmental air quality due to less chemicals and harsh compounds in the paints, mirror mastic and cleaning products
- A healthy and delicious variety of organic and seasonal foods, with 60% of the herbs at their freshest, picked from the Aquaponic herb garden in the restaurant
- Monitoring for additive and processing aids in ingredients
- Water is bottled onsite into glass bottles; ensuring guests do not consume water that is laced with chemicals from the plastic used in the bottling process.

2. Better for the community

Our procurement processes are aimed at benefitting local communities:

- We make a conscious effort to procure food and beverage products locally, within a 160km radius of the hotel
- We prioritize the sourcing of organic and fair trade labels and promote entrepreneurship and fair trade practices by especially supporting previously disadvantaged young, local businesses. (nazeema)
- Artworks displayed at the hotel were sourced locally. South African artists designed all art and many were created in the sustainability art project in which Hotel Verde teamed up with Niklas Zimmer and local schools.

3. Better for the planet

All of our products are procured locally which means a saving on the carbon associated with transport.

- Most of our products get delivered in recycled crates and boxes that are immediately unpacked. The packaging is returned to the supplier for re-use. We are in the process of eliminating all non-recyclable packaging from all of our suppliers
- Small urban farming set-up and urban beehives have a positive effect on biodiversity
- Onsite water purification, carbonation and bottling facilities relate to a huge environmental saving.
- The menus are made using pieces of wood from shipping pallets that the regenerative drive elevators came in

- All equipment procured for the hotel is as energy/water efficient as possible. The following list includes most of the equipment used by Hotel Verde.

Carbon Offsetting

Carbon footprint

The carbon footprint of the hotel is calculated on an annual basis according to both the Hotel Carbon Measurement Initiative (HCMI) as well as the Greenhouse Gas Protocol (GHG Protocol). HCMI is the global carbon footprinting standard within the hotel industry and allows for an “apple to apples” comparison of hotel carbon footprints and more specifically allows for the comparison of the carbon footprint “per room night” and “per hour-of-use of conferencing facility”. The GHG Protocol is the world’s most recognised standard in carbon footprint calculations and was used as the basis for the equivalent ISO standard.

Guest Certificates

The carbon footprint “per room night” and “per hour-of-use of conference facility” takes into account the scope 1 and 2 emissions of the hotel. Hotel Verde then offsets these already significantly reduced emissions through the responsible purchasing of carbon credits thereby providing guests the benefit of a carbon neutral experience at the hotel. This offsetting is done through a partnership with impactChoice, emission mitigation consultants, who facilitate the purchasing of carbon credits and provide guests and conference delegates with accredited certificates. Guests and conference delegates can then use their accredited certificates in their personal or business records to prove that their experience at Hotel Verde was carbon neutral adding more value to their stay at Hotel Verde.

Carbon Neutrality

At the end of each year the carbon footprint of the hotel is calculated according to the Greenhouse Gas Protocol (GHG Protocol). This carbon footprint measurement protocol takes into account the total emissions for the entire business. Because scope 1 and 2 emissions are already offset during the year as each guest’s stay or use of the conferencing facility is offset, the only remaining emissions not yet offset is the difference between these and the total footprint according to the GHG Protocol. At the end of each financial year when the total carbon footprint for the building is calculated the remaining emissions of the business are offset through the responsible purchasing of carbon credits. This is achieved through a partnership with impactChoice, emission mitigation consultants, who perform the calculations and facilitate the purchasing of the carbon credits. This then renders Hotel Verde “carbon neutral” according to the GHG Protocol.

Social Responsibility and Awareness

Guest involvement

Guests are encouraged to be involved through many interfaces within the operation of the hotel. Educational posters and signs are tactfully and strategically located around the building informing guests of sustainable features. There is a screen in the lobby displaying live data and information regarding the use of energy and resources to help guests get a feel for how much energy was saved during their stay and bring the concept home to them. Another good example of this is a poster in the gym showing guests what every day appliances they would have been able to power during their workout using the energy generating gym equipment. If a guest cycles for an hour and learns that this only generated enough energy to make 2 pieces of toast the next time they make toast in the morning they will have a new perspective on how much energy they use on a daily basis.

At checkout guests are given the option of receiving their invoice via email instead of having it printed.

Green Channel

The in house TV will soon have an interactive Green channel which will allow them to see statistics about the hotel's energy and resource use, a video describing the journey of the building of the hotel from start to finish and other educational videos on sustainability.

Guests incentives

Guests are incentivised to partake in the sustainable lifestyle at Hotel Verde by offering them rewards for certain activities or for abstaining from others. An in house currency has been developed for this purpose called a Verdino. A Verdino can be used anywhere in the Hotel as real money for things such as meals at the restaurant or curious and the gift shop and kiosk. The guest can earn a Verdino for any of the following activities.

- re-use the towels in their room instead of having them washed daily
- refrain from additional air-conditioning usage over the already preconditioned air supplied to guest rooms
- use energy generation equipment in gym which feed power into building
- jog around the eco-trail
- cycle to the hotel
- arrive with public transport
- arrive with a low emitting/ fuel efficient vehicle
- Enviro-box

Weekly 'earth-hour'

Once a week the Hotel has its own "earth-hour" when non critical equipment and lights are switched off for one hour to create awareness.

Local community involvement and social upliftment schemes

The kiosk will soon display & sell local arts and crafts from the nearby communities. The kitchen is in the process of developing relationship with local small scale urban farming initiatives in order to source fresh produce from them

In-house Lifestyle Changes

On-going staff training and education

Staff all receives training when they start at the hotel and will continue to receive training and educational talks so that sustainability is not just their job but also their lifestyle and they take what they learn back to their homes and communities.

Staff incentivised to recycle by using recycling rebates for staff functions
Monthly rebates received from the recycling material are used to fund staff functions and parties thus incentivising staff to participate in the recycling and sorting of waste.

Staff participation in waste sorting

Each week a different staff member is assigned to help with the sorting of the recycling waste in the waste area including Mr Delicio the owner himself. This shows staff first-hand how important it is to put waste into the correct bins because somewhere down the line there is somebody that has to sort and separate it into the various waste streams for recycling.

Paperless office operation as far as possible

Wherever possible the office is a paperless operation and items are only printed if absolutely necessary.

Green team / environmental committee

Within the staff there is Green Team consisting of around 10 members who meet weekly to discuss matters regarding sustainability. This includes creating sustainability goals and targets, assessing progress, bringing forward and implementing new ideas as well as planning ways to celebrate environmental days and holidays to create guest and staff awareness.

Reducing wastage

Staff are encourage and taught to reduce waste in as many ways as possible within their sphere of work. This concept will be taken home by the staff members to their homes and communities.

Switch off unused lights and equipment (if not done so automatically)

Staff are taught to be mindful of switching off equipment and lights when they are not in use.

Electric shuttles

Shuttles used to transport guests to and from the Cape Town International Airport are electric shuttles and have zero direct carbon emissions.

Enviro-box

The Enviro-box is an initiative to reduce the need for washing laundry by placing a box in each bedroom into which guests can place any linen, towels and cushion covers that they will not use during their stay. Housekeeping staff can merely take these items out and use them for the next guest.

Guest amenities dispenser

Guest amenities in bedrooms (shower gel, soap and shampoo) are provided in dispensers as opposed to the conventional small plastic bottles and soap wrapped in wax paper.

Book exchange

The book exchange initiative is one that allows guests to swap a book of their own for one in the book exchange library. This prevents the purchasing of brand new books, saving the associated carbon footprint whilst also promoting a culture of reading and sharing.

Maintenance

Electricity usage sub-metering, monitoring and optimisation

The intelligent building management system (BMS) monitors the consumption of resources such as water and electricity. Sub-metering also means that the maintenance team can see which areas or systems of the building are using the most electricity and focus on reducing that. Furthermore sub-metering detail on whether an area or system is using more than usual, this can then be investigated and potential early warning signs treated and preventative maintenance conducted. Other information such as the waste produced on site is entered into the BMS to be tracked and monitored in order to assess progress and goals.

Photovoltaic panel cleaning

An externally mounted irradiance meter tells BMS how bright the sun is and continuously compares this to the amount of energy produced by the photovoltaic cells. If this value drops it shows that the photovoltaic cells are not performing at their optimum efficiency. The BMS then sends a signal to the maintenance team to alert them that the panels require cleaning.

Repair leaking fittings immediately

A strict “no leak” policy is held by the maintenance team and if a leaking fitting is reported is it repaired immediately.

Surrounding Environment

Neighbouring Wetland

Hotel Verde rents the property on which the wetland/retention pond is situated. It is on the adjacent property from the City of Cape Town and was restored in attempt to increase the surrounding location’s biodiversity.

The natural vegetation at Hotel Verde is Cape Lowland Freshwater wetlands. Although it occurs in the Fynbos biome, this vegetation has a cosmopolitan character as indicated by the occurrence of species with worldwide distribution. The vegetation & faunal assemblages are a good representation of a wetland habitat of the Cape Flats.

Other Vegetation Found

- Vlei grass (*Paspalum vaginatum*)
- Buffalo grass (*Stenotaphrum secundatum*)
- Waterbieszie (*Pycreus nitidus*)

Some of the fauna found in the wetland since restoration includes;

- The Cape Sand Frog *Tomopterna delalandii*
- Cape Caco (*Cacosternum capense*)
- The Cape Skink (*Trachylepis capensis*)
- Common Brown Snake (*Lycodonomorphus rufulus*)
- Cape Horseshoe Bat (*Rhinolophus capensis*)
- Cape Golden Mole (*Chrysochloris asiatica*)
- The four-striped grass mouse (*Rhabdomys pumilio*)
- The Cape Dune Mole-rat (*Bathyergus Suillus*)
- Red eyed dove (*Streptopelia semitorquata*)
- Blacksmith Lapwing (*Varnellus armatus*)
- Common Fiscal (*Lanius Collaris*)
- Cape Wagtail (*Motacilla Capensis*)
- Cape Robin Chat (*Cossypha caffra*)
- Black Crake (*amaurornis flavirostris*)
- Cape Weaver (*Ploceus capensis*)

Beehives on site

Next to the storm water pond, we have established 2 urban bee hives which house around 60,000 Cape Honey Bees who are enjoying the developed wetlands, in turn increasing the beauty and plant life through pollination. The beehives have also begun to produce their own honey to be found in the restaurant and deli.

Landscaping & area upliftment

Verde Hotels took to improving the area surrounding the hotel:

Feature	Meters
Cycling/Pedestrian path	404m
Planting of verge	110m
Irrigation	110m
TOTAL	

Linwabo's and Sinethenba's Garden

Two of our gardeners have been cultivating their own garden, using the breeding ground of the hotel's restored wetland. In that little piece of protected land, they are growing several types of organic vegetables, such as tomatoes and spinach.

Eco Pool

Hotel Verde's eco-pool considers the environment as the water is kept sparkling clean by circulating it through a living ecosystem of water plants. The result is water, which is perfectly clean, soft on the skin and better for our guests and the environment in comparison to conventional pools. No salt, no chemicals, no sterilisation equipment. It is also monitored, as an ideal environment we need to ensure that population within is monitored and controlled.