

VODAFONE SITE SOLUTION INNOVATION CENTRE

Net Positive Ecology (Pilot) - Level 1 & Net Zero Carbon (Pilot) - Level 2
 Site Ecology - Brownfield (modelled) & Occupant Emissions (modelled)
 Including 0% Offset Purchased

NET POSITIVE
ecology

AFRICA
South Africa
VODAFONE SITE SOLUTION
INNOVATION CENTRE


PILOT - Level 1: Site Ecology - Brownfield (modelled)
 - Including 0% Offset purchased
 Level 1 | Level 2 | Level 3 | Level 4 | Level 5
 Validity: Oct 2017 to Oct 2020



NET ZERO
carbon

AFRICA
South Africa
VODAFONE SITE SOLUTION
INNOVATION CENTRE

PILOT - Level 2: Occupant Emissions (modelled)
 - Including 0% Offset purchased
 Level 1 | Level 2 | Level 3 | Level 4 | Level 5
 Validity: Oct 2017 - Oct 2020





The Vodafone SSIC in Midrand, Johannesburg was developed and completed in 2011. Located within its exclusive vegetated space, the building presents itself as a transparent glass box with large overhangs and a naturally ventilated double-facade to avoid undue problems of solar heat gains. The inner courtyard, completely enclosed within the building, allows for a fully openable facade without compromising security. The service core is located on the West facade, further mitigating the solar heat gains due to low sun angles in the late afternoon. The aesthetics beautifully presents a harmonious and seamless integration between the physical building and the surrounding landscape, and the building is available for visitors to view the low energy, sustainable design and construction solutions.

Project Initiatives

- A 55KW Photovoltaic installation fitted on the roof and walkways with an expected output of 92 467kWh per annum.
- Comfort levels achieved through a combination of a thermally activated slab, radiant space panels, rapid response heating and displacement ventilation.
- Cooling technology includes: solar absorptive chiller, rock stores and thermal mass to maintain high levels of thermal comfort.
- LED luminaires linked to daylight sensors with 100% views to the outdoors.
- 70% of the site is covered in indigenous and endemic vegetation.
- A courtyard with a 20 sqm-constructed wetland, which attracts both bird and insect life, thereby enhancing the biodiversity of the site.

Project Obstacles

- Unique systems were trialled without any local experience of implementation or maintenance thereof. The project team researched multiple initiatives including geothermal heat rejection/reclamation, radiant flooring, rock store design and efficacy and solar thermal absorption chillers coupled with a dry cooling tower. This was time consuming and the project team had to rely on international examples to test the concept.
- Sourcing cutting edge and environmentally friendly technologies locally proved to be a challenge, as most of the technologies and products were not readily available in 2011. At the time, low formaldehyde gulam was unavailable. The contractor used imported glue to laminate the timber. Due to inexperience of using this product the gulam delaminated and had to be redone. The solar photovoltaic system was imported from the USA. While being shipped the company was made insolvent, which resulted in not being able to get support from the manufacturing entity.
- The expertise for timber construction was not readily available. In the end we used a roofing contractor to build the buildings top structure and roof.
- Tight project time line of nine months from breaking ground to construction and occupancy. Timeline prevented the project from pursuing black water treatment system owing to the requirements to conduct a full EIA.

Project Wins

- The project was sanctioned by Vodacom who allowed the team to explore concepts that had not been tested in South Africa. From the outset Vodacom management in South Africa, and Vodafone in Germany set the target of achieving a 6 star building, which should be as close to net zero as possible. This allowed the team to explore unusual and ground breaking systems for the building.
- The limit on the buildings design was informed by an energy budget. The energy budget was defined by the average energy provided by the Solyndra panels. All pumps, fans, lighting, security systems, office equipment and of course the coffee machine had to fall within this energy budget. This compelled the team to pursue more passive design initiatives to achieve day to day operations falling within the energy budget.
- The site chosen was formerly a tarred parking area. The landscape which was transformed into an undulating indigenous garden reclaimed the environmental integrity of the site. Most of the plants selected were endemic to the Highveld Grassland biome. The advantage of using indigenous and endemic plants is that they require significantly less water and are more robust against insects and disease. The end result is that 70% of the site area was covered by indigenous gardens, reducing the heat island effect that is associated with a tarmac parking lot.
- The drainage design drains the grey water from the handwash basins and kitchen basins into a constructed wetland located within the central courtyard of the building. This water is naturally purified and scrubbed through root action of the reed bed. This water together with harvested rainwater is used for flushing and any irrigation that is required.
- The team experimented with available technology using it in non-prescribed applications. Radiant ceiling panels were used in a vertical application to provide additional cooling to the room while serving as a room partition. Customisation of these technologies in order to best fit/suit the project needs, overall environment and building users.
- Where ever possible, the project sourced local materials and sought to enhance local skills driving transformation, guiding and encouraging the local product and material market to embrace green principles and designs.

PROJECT TEAM:

OWNER
Vodacom SA

ARCHITECTS
GLH

ELECTRICAL ENGINEER
OneZero

MECHANICAL ENGINEER
WSP

QUANTITY SURVEYORS
BHA

STRUCTURAL ENGINEERS
WSP

NET ZERO & SUSTAINABILITY CONSULTANT
WSP

WET SERVICES
WSP