Figure 1: A scale model showing Palace Architects interpretation of the design brief

Palace Architects outshine the rest to create a Royal Palace for the King of Lesotho

About the project

Following an international design competition, Palace Architects was awarded the contract to render Architectural services for the Design and Construction of the New Royal Palace in Maseru. Due to the ever increasing costs and dearth in electricity and water, the client required that energy efficient solutions, use of renewable energy and the management of water be investigated and implemented. In the course of the design process, the division's approach on the energy efficiency of the building was twofold, specifically in Design (geometric and constitutive elements) solutions and Equipment and Technology solutions.

Design approach

The proposed design takes the following elements into consideration: Orientation, Natural ventilation and Insulation of the shell and services (piped reticulations). These elements allow for the reduction of energy input enabled by the limitation of losses, usage of the structure's inertia and thermal insulation, and the limitation of energy usage by taking advantage of natural elements such as sun and airflow. These principles have been in existence for decades in Europe and elsewhere in the world yet they have only recently spread to Southern Africa as a result of the country's power supply challenges.

Equipment and Technology approach

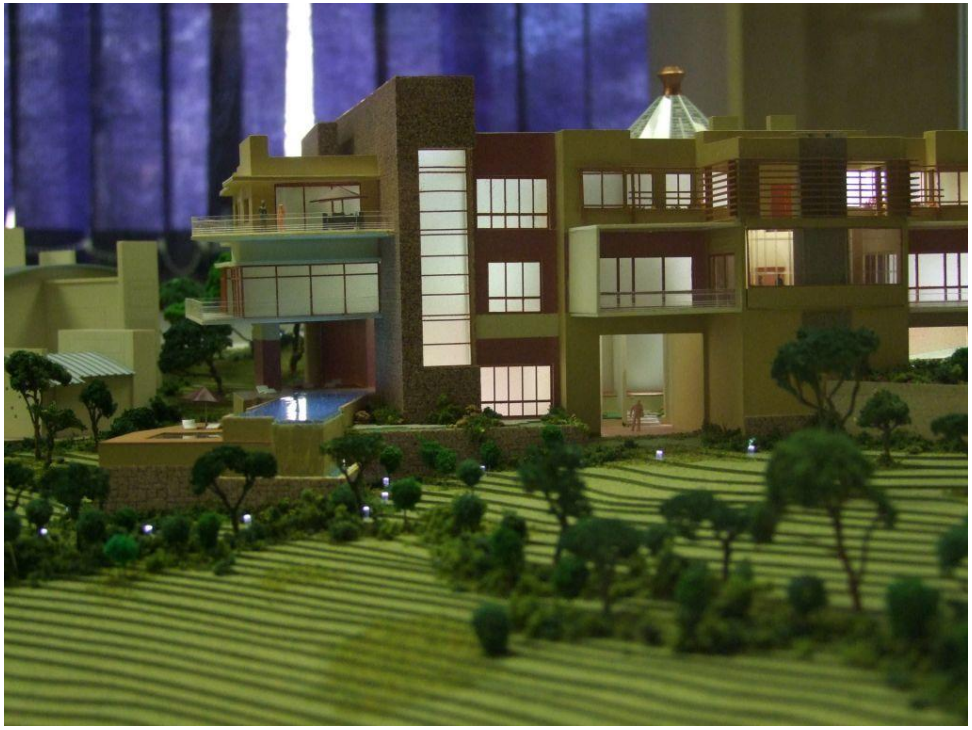
The recent trends in technical development witnessed worldwide allow for further reduction of the level of affected electricity through different methods. The improvement of photovoltaic panels and their generation capacity is one of the methods, together with the new air conditioning or heat recovery systems. Another technical development that the architectural division is considering has been the perfection heat pumps. One application that spreads rapidly and widely in the northern hemisphere is the very low energy geothermic generation. In this technology a fluid running in a pipe mat laid horizontally about 500mm deep in the ground will gather heat from the ground and transfer it via a heat pump and assists in the generation of hot water for domestic use, under floor heating or even air-conditioning.

There are many solutions available and the challenge is once again to identify and limit its choices to the most adaptable solution. There are numerous efficient solutions available today. The challenge is for us consultants to select and implement these systems and devices in an integrated manner, considering all local geographic and human conditions. The building should not only be energy efficient but financially viable in the long term.

Water

Water is a very scarce resource in Southern Africa. The division is investigating the pertinence of managing, treating and storing all forms of water ranging from storm water, to grey and black waters. Once treated, the water could be used for irrigation, for drinkable and non-drinkable water inside the building, depending on the methods and treatments implemented. There are many solutions available and the challenge is once again to identify and limit its choices to the most adaptable solution.

Many of these technologies have been in existence for decades and might have had industrial applications from the onset. It is only recently, with the current improvements, rise in energy cost, drop in natural resource reserves and the spread of environmental concerns that they became viable solutions to the residential or commercial buildings sectors.



Figures 2&3: Scale models showing Palace Architects interpretation of the design brief that clinched the hearts of the client