B A T T L E M c C A R T H Y ©
Consulting Engineers & Landscape Architects

PROJECT:
University of Luanda, Angola

CLIENT:
Government of Luanda

ARCHITECTS:
Perkins & Will

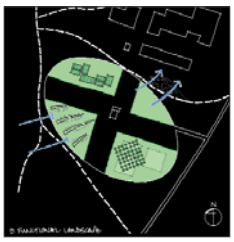
BM SERVICES:
Landscape Architecture, Environmental Analysis, Structural & Building Services (MEP) Engineering

COMPLETION:
Due 2004

VALUE:
$200 million

DESIGN BRIEF

To develop a sustainable masterplan with Perkins and Will for a new 400,000 m² university campus for Angola, sited on the outskirts of Luanda. The brief called for a design that would meet international standards for educational facilities, but also reflect the cultural values of the nation.



London UK Office
T: +44 (0)20 7440 8282
F: +44 (0)20 7440 8292
E: admin@battlemccarthy.com
www.battlemccarthy.com

DESIGN INITIATIVES/ACTIONS UNDERTAKEN

The design team identified that the budget allowed would not be sufficient to provide full air-conditioning to the whole development, as had been first envisaged. It was therefore determined that many of the faculty buildings would be designed to be naturally ventilated.

Whilst parts of the year are ideal for natural ventilation, there are periods when the conditions are hot and humid. The normal approach to achieving comfort during this period would be to turn on the AC, but that would not be an option in the areas that did not have AC and so a serious natural ventilation strategy had to be developed.

The initial step was to carry out careful analysis of the prevailing winds as these would be the drivers to catching breezes and maintaining comfort throughout the warm periods of the year. The need for day lighting was identified to keep internal gains (and energy costs) to a minimum, with excess solar gain (diffuse and direct) filtered out before it had a chance to impinge on the occupied spaces.

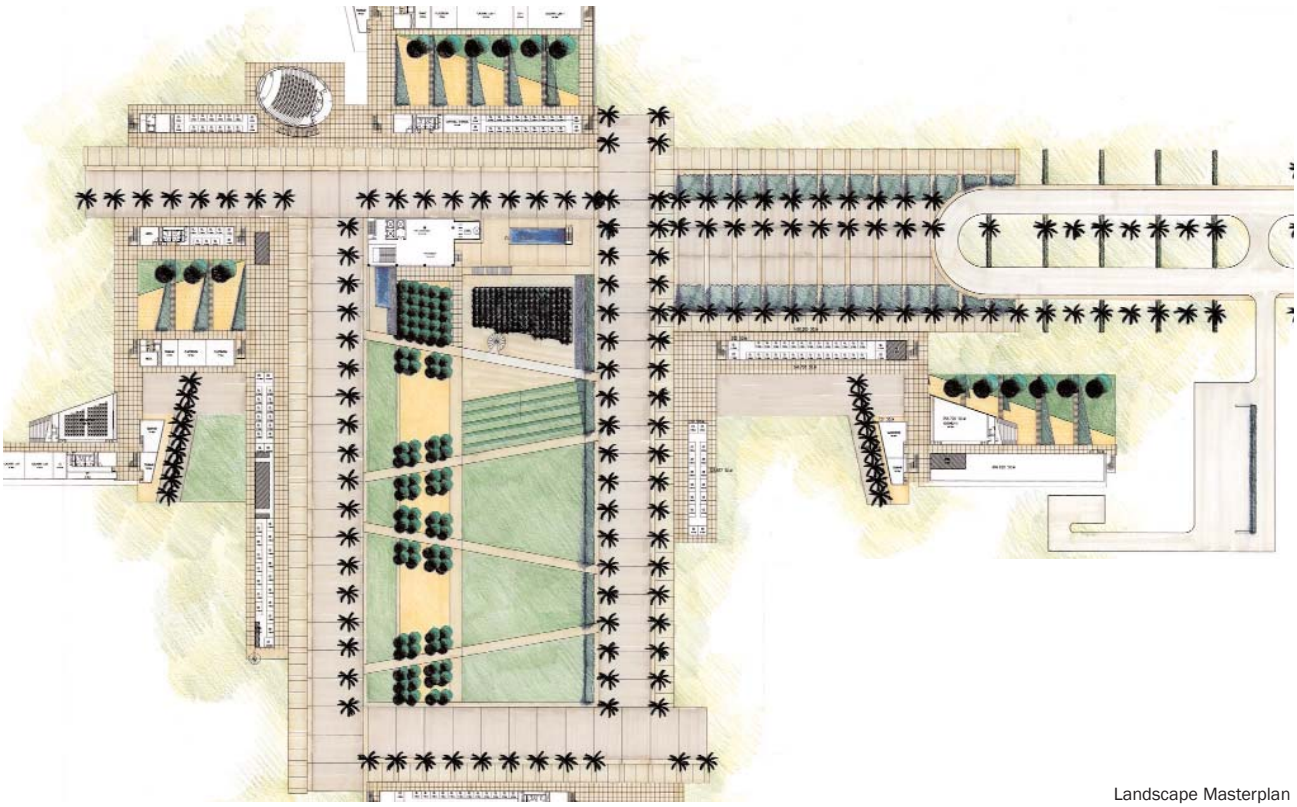
In response, the following key moves were made very early on in the design process.

The architects adjusted the whole orientation of the plan to take into account the prevailing winds which were optimised to provide both cross ventilation and external space air movement. This included the designation of areas of the masterplan where the landscape was designed to capture and direct airflow to the buildings.

A typical building section was developed that reached up to capture the winds and drag them through the classrooms. The planning arrangement was made so that the ground floors were generally air-conditioned whilst the upper floors with greater access to airflow would be naturally ventilated. In addition, a corridor was positioned on the most solar exposed side of the building section to reduce gain and act as a buffer zone.

Careful analysis of the design was carried out employing computational fluid dynamics to assess and optimise shape and form with respect to the prevailing winds as well as carrying out detailed comfort analysis. This analysis showed that despite the warm conditions it would be possible to maintain comfort within acceptable cultural boundaries (adaptive comfort model).

The first phase of the project is currently under construction.



Landscape Masterplan