Rethink Athens

Towards a Sustainable, comfortable City of Athens

Rethink Athens is a vision for the redesign of the inner city of Athens. It was developed by OKRA Landscape Architects and won first place in a competition held by the Onassis Foundation.

The OKRA vision for Athens provided a multi-disciplinary redesign that accounted for traffic flows, cultural and social exchange, and enhanced sustainability using green and blue technologies.

FACTS

Client
OKRA Landscape Architects, Utrecht, The Netherlands
Onassis Foundation, Athens, Greece

Implementation period
2013-2014

Used Features
ENVI-met holistic microclimate model; single walls as shading devices; water spray cooling

Together with OKRA Landscape architects (Utrecht, NL) and Werner Sobek Green Technologies (Stuttgart, D), the ENVI-met team analyzed the capacity of the OKRA design proposal to improve air temperature, thermal comfort and building energy usage within the city of Athens.

Strict target criteria according to Greek standards had to be achieved by the proposed designs, including:
- Reduction of maximum air temperature by at least 1.5°C
- Decrease in maximum surface temperature by at least 5 %
- Improvement of a Thermal Comfort Index (also known as physiological equivalent temperature or PET) by a minimum 20 % during the day
- Reduction of air conditioner usage (cooling hours above 26°C) by at least 20 %

The ENVI-met analysis was carried out for four specific locations and three roadways in the city of Athens and proved that the OKRA design was able to fulfil the target criteria.

Shading devices lowered the solar input significantly and improved thermal comfort over large areas. Using alternative natural materials such as wood and light-colored ground surfaces, the heat storage could be lowered significantly, which also lowered the night-time Urban Heat Island (UHI) effect. The simulations were supported by local measurements carried out by the University of Athens in order to improve and verify the existing material thermal properties used in the ENVI-met model.