Low-impact environmentally-responsive house, Cape Town, South Africa

Project data

Type of project: Architecture (housing)
Estimated start of construction: February 2009

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Comment of the Holcim Awards jury Africa Middle East

The project's strength lies in the thorough research and planning and careful execution of this resource conserving and spa-
tially-inspiring dwelling on a site within a harsh Cape-coast climatic zone in South Africa. The result is a very attractive living
space which is in harmony with its environment. The light, open frame-like structure, sliding screens and glazing as well as the
continuity of finishes blur the boundaries between inside and outside.

The house seeks to make use of and recycle any available natural resources so as to put minimal strain on the environment.
In addition, solar energy, solar heating, rainwater harvesting and biological waste processing will ensure independence from
any public utility network. The jury has commended this project both for its formal and light-structure approach to the sensi-
tive site and the smart implementation of sustainable materials and construction techniques.

Project description by author

Elemental house: this project is for a home which is in har-
mony with its environment. The house responds to the harsh
Cape coastal climate in such a way that it will allow the users
to enjoy the surroundings in all seasons.

Mapping context: a design process integrating a range of
specialist evaluations and mappings deconstructs the rel-
vent contextual issues and client brief. The results of these
mappings form the basis upon which the design is found-
ed. The following issues were studied: 1) client brief: spatial
needs, occupation levels, flexibility over lifespan; 2) heritage
and spatial form: Kommetjie coastal town; 3) biodiversity
flora of the coastal thicket (milkwoods); 4) landscape form:
dune cannon; 5) orientation: due north ideal for seasonal
use and control of solar radiation; 6) views: mapped at dif-
ferent levels create dynamic relationship to the landscape
and changing views; 7) climatic seasonal changes in tempo-
rate, moisture, air movement; 8) local materials, suppliers,
contractors and labour.

Nature form: we prioritized developing a dynamic spatial
strategy in relation to the awesome landscape. The house
is purposefully sited within its context in a clearing in the
milkwoods, connected to the panoramic views, and orien-
tated to the daily and seasonal shifts of the solar system. A
place making strategy brings key elements of earth, wind,
fire, and water to form a natural home to the house an ele-
mental "inside/outside" room in the coastal forest. The open
frame-like structure, slide away screens and glazing and con-
tinuity of finishes allows the boundaries between inside and
out to be blurred. This inside-out theme is further elabo-
rated through the integration of endemic planting screens
which grow from the garden into the envelope of the house.
Overhanging eaves combine with slatted screens provide
shady respite from the hot African summer sun whilst allow-
ing in winter warmth. Planted screens provide shelter from
the strong prevailing summer winds.

Natural resources: the house seeks to make use of and recycle
any available natural resources so as to put minimal strain on
the environment. A complete site evaluation was done in
order to determine the most appropriate passive energy
strategies. These include a large off grid solution with use
of solar power, solar water heating, LG gas for cooking, rain
water harvesting, grey water recycling, ecological pool, pas-
sive heating (solar radiation, double glazing) and cooling
(summer shading, cross ventilation). Materials and technol-
ogy selection was guided by preferences for low embodied
energy and low toxicity options.

Relevance to target issues by author

Quantum change and transferability

A systematic research phase preceded design work. All key
contextual issues were investigated to ground the project
in its locale. Reading and interpreting the landscape uncov-
ered opportunities and constraints which engendered in-
novation. A symbiotic relationship between the elemental
place making and the landscape seats the building and its
occupants in direct dialogue with nature.

Ethical standards and social equity

Maximizing use of natural renewable resources and energy,
local materials and labour make this project largely self-sus-
tainable and minimizes waste. In order to curtail impact on
the environment a number of measures were introduced.
The modest scale of the house, modulation of the form and
integration of planting mitigates its visual impact on the
area and landscape.

Ecological quality and energy conservation

The high integration with spatial qualities of the landscape
and technical environmental responses for this project to
its place. Integration of varied endemic planting and repa-
ration of the coastal forest develops biodiversity. The ther-
mal performance is designed to for seasonal shifts of the Cape
summer. Summer solar gain is mediated by wide eaves, lou-
ered timber screens and cross ventilation. Winter heat loss
is tempered through northern orientation, double glazing,
thermal mass and closed combustion fire space heating. The
use of solar photovoltaics units for energy and solar water
heaters further conserves the consumption of energy.

Economic performance and compatibility

The integration of sustainable natural resources economiz-
es the consumption of non-renewable resources. The house
caters largely for its own energy through harvesting of solar
radiation for energy and fuel. Planted screens provide shelter
from the hot African summer sun whilst allowing

In winter warmth. Planted screens provide shelter from
the strong prevailing summer winds.

Contextual and aesthetic impact

The modest scale, articulated open form, lightweight filigree
screens and integrated endemic planting is appropriate for
the location of the house in the coastal forest and part of
the coastal village of Kommetjie. The articulation of the en-
velope to deal with changing seasonal conditions leads to
an architectural language built up from a direct response to
climate and context. The pavilion-like structure reminiscent
of a beach lookout with floating roof, deep eaves, slide away
timber screens, planted wind shelter, roof top viewing ter-
race, intimate planted courtyard and sited in a dynamic con-
nection to the landscape help to complete the experience of
living in nature.