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

Project description by author

Elemental house: this project is for a home which is in harmony 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 relevant contextual issues and client brief. The results of these mappings form the basis upon which the design is founded. 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 corridor; 5) orientation: due north ideal for seasonal use and control of solar radiation; 6) views: mapped at different levels create dynamic relationships to the landscape and changing views; 7) climatic: seasonal changes in temperature, moisture, air movement; 8) local materials: suppliers, contractors and labour.

Natural 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 oriented 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 heart to the house and its occupants. The making of place makes key elements of earth, wind, fire, and water to form a natural heart to the house and its occupants. The making of place.

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 uncovers opportunities and constraints which engendered innovation. 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-sustainable 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 to this project to its place. Integration of varied endemic planting and re-purposing of the coastal forest develops biodiversity. The thermal performance is designed to for seasonal shifts of the Cape summer. Summer solar gain is mediated by wide eaves, louvred timber screens and cross ventilation. Winter heat loss is tempered though 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 economizes on the consumption of non-renewable resources. The house caters largely for its own energy through harvesting of solar radiation for energy and water heating. Energy-efficient appliances are specified. The water system includes harvesting rainwater, processing and recycling waste water, low flow and water wise sanitary fittings.

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 envelope 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 terrace, intimate planted courtyard and sited in a dynamic connection to the landscape help to complete the experience of living in nature.