

Shakira Residence

India / Kannur, Kerala

11.92265677, 75.45397282

Client Name: Mrs. Shakira & Mr. Abdul Razak

Project website:

249,99,58,0.6

Project Description

This residence was designed for a teacher couple and their two children. For us, it is the culmination of a deep desire to design and build a net zero energy building. To make this possible various passive elements such as louvers, fins and extended roof coverings have been added to reduce solar heat gain. Large openings at vantage locations increases ventilation and comfort to the end- user.

Building Details

Type of Building

Residential

Type of project

New building project

Site Area

367.91 m²

Number of Floors

1

Gross floor area

150.97 m²

Net floor area

120.77 m²

Non Air-conditioned area

110.39 m²

Performance Standards

N.A

Total Cost

INR 35,00,000

Cost per m²

INR 23,650

Year of completion

2017

Year of occupancy

2017

Project Team

Organisation

Habitat Architectural Services

Website

N.A

General contractor

Mr. Mahmood

Structural Engineer

Ar. Anas Ahmed Moosafi

Architech

Roshan Nageena Sabeer

Architect's profile

Roshan Nageena has experience in design, construction and supervision of diverse projects such as institutional, residential and healthcare facilities. Keenly interested in sustainability and conservation of energy through all project phases and likes to design aesthetically attractive, architecturally sound and utilitarian spaces.

Architech

Anas Ahmed Moosafi

Architect's profile

Anas Ahmed Moosafi was involved in the structural consultation for this project and gave valuable design inputs for the same.

Climate Analysis

Describe the local climate

Kanhirode is located in a region of undulating hills situated 16 km to the East of Kannur in North Kerala .The district has a humid climate with an oppressive hot season from March to end of May .This is followed by the S-W Monsoon which continues to the end of September. October & November form the post monsoon or retreating monsoon season. The NE monsoon follows & extends up to Feb although rains cease after December these days. Kannur is a coastal town flanking the Arabian sea.

Design Approach

Concept

The concept for this residence was to create a home which would minimise energy loss throughout its construction and use. Every element has been carefully considered to fulfill this principle.

Site integration

The building sits on a level site. The ground level was raised by a foot to prevent water inundation during heavy rains. Breezes are predominantly from West and South West and sometimes from North East as well. The immediate surroundings are residential plots . The site is small with the longer axis oriented in the E-W direction.

Building design

The building has been oriented with the longer axis facing E-W due to lack of space. Deck & wide roof coverings have been providing to the East & West to minimize solar heat gain. Buffer spaces like toilets, Decks & Utility areas have been provided on the west face.Court yards within built-up spaces helps to regulate the internal temperature.

Special Feature

Natural Lighting

Day light is the primary source of light. The west facade is protected from solar radiation using wooden strips.

Water efficiency

Rainwater percolation pits are being provided at the lowest point on site.

Passive heating/cooling

This residence is naturally cross ventilated with a window to wall ratio of 37.50 %. The west facade is protected from solar radiation using wooden strips. Large roof overhang and buffering spaces have been created to minimise heat gain. A double roof with an air gap has been provided and the cost implication for this works out to be medium. The native plants around the building have been retained as much as possible .

Cost effective features

Readily and locally available materials like laterite stone and terracotta tiles have been chosen for this project. The cost also worked out to be medium.

Eco-friendly features

Use of low environmental impact materials during construction.

Other features

Solar panels are being provided above the truss roof and a hybrid system has been adopted in this project.

Energy systems

Interior Lighting

37

Exterior Lighting

23

Ceiling Fans

7

Air-conditioning

3

Lift

N.A

Energy efficient systems

Energy efficient fans and L.E. D lights are being used throughout the residence.

Energy efficient systems

A hybrid system of grid and a small inverter battery have been proposed to meet the energy needs of this residence. 12 sq.m. of photovoltaic panels will provide sufficient energy for the lights and fans in the residence. We are hoping that the solar photovoltaic panels will meet upto 20% of the energy needs required in this residence.
