



NANGAL EDUCATION CENTRE

Project description (prepared by our partner Architecture & Development)

CONCEPT

The building is meant to be a demonstration of sustainable building practices with a special emphasis on the environmental impact of the building.

The environmental impact of the building is measured according to three factors:

1. The level of pollution, energy consumption and natural resource depletion caused in the production and transport of the construction materials.
2. The climatic adequacy of the materials and architectural solutions, which will determine the amount of energy consumption and environmental comfort.
3. Building equipment and eco-features, which determine the self reliance and environmental footprint in terms of water, energy and waste treatment.

We will bring together several local professionals, with experience in this field, to work together on the conception of the NEC. We have chosen 7 themes to consult on externally:

- Energy management and efficiency – Hemant Lamba (CSR – Auroville)
- Bio-climatic and earth architecture - Suhasini Ayers (AVBC – Auroville)
- Greenery & landscaping – Mohan S Rao (Satva – Bangalore)
- Water management - Mohan S Rao (Satva – Bangalore)
- Waste water treatment – Rain Water Club (Bangalore)
- Traditional technologies & architectural solutions – Ajit Koujalgi (INTACH)
- Communication design – A&D Bangalore office

DESCRIPTION

The layout of the building is organised in an L shape around a courtyard that faces the public playground and a large, round cyclone shelter. For safety and environmental quality purposes, the layout gives the back to the main road, on the North side of the plot. 2 classrooms and the multipurpose room are on the North side of the plot, facing South, and 1 classroom and other spaces on the West side of the plot, facing East. The courtyard is thus on the South East side of the plot. The South East side of the building, facing the courtyard is protected by a tiled canopy, covering an open corridor. The only entrance to the complex faces the public playground. The cyclone shelter helps to enclose the courtyard, giving a visual limit to it. The L shape leaves an open space in the North West corner as a backyard that will integrate to the multipurpose room, and leaves space for a possible future enlargement of the 3rd classroom.

CONSTRUCTION TECHNOLOGY

The three abovementioned environmental factors, along with the availability and affordability of the materials, the government regulations and the capacity of the local masons to apply the necessary techniques, have determined the choice of material and technology:

1. Foundation

Stub foundation in local burnt bricks and cement mortar (1:5 mix) up to plinth level. The foundations include a grade beam at ground level (reinforced concrete 23x12.5cm). Below the plinth, there is an anti-termite coat. The filling below the floor is sand to prevent termites as well.

2. Superstructure

Load bearing walls in 'rat-trap-bond' using local burnt bricks with red soil mortar (1:4:6 mix, cement+sand+soil). The walls of the block A (North) are crowned by a roof belt on which the roof stands (reinforced concrete 23x7.5cm). The walls of the block B (West) have a lintel belt at lintel level (reinforced concrete 23x12.5cm) and a roof belt at roof level (reinforced concrete 23x12.5cm). All corners and wall joints are reinforced with 2 or 3 vertical 10 mm steel rods that tie vertically the grade and the roof belts.

3. Compound wall

Rammed earth using soil+sand+cement mix, 30cm wide and 180cm high.

4. Roofing

Block A (north): Mangalore tiles with traditional Tamil wooden structure (palmeera rafters) and country wood purlins. Bison board ceiling (244x122x2 cm) between the rafters and purlins.

Block B (west):

Class room: Structural arches with local burned bricks and soil mortar, wooden beams and brick vaults in between the beams. Lime concrete terracing with 25mm size brick aggregate and 50% lime mortar 1:2 (1 lime putty: 2 surki), finished with gur and belgiri treatment. Terrace flooring with pressed clay tiles (20mm) jointed with cement mortar 1:4 mixed with 2% intergal water proofing compound laid over a bed of 20mm thick cement mortar 1:4.

Toilets: vault made of burned bricks with terracing (same as classroom).

1st floor office: Mangalore tiles with traditional Tamil wooden structure (palmeera rafters) and country wood purlins. Bison board ceiling (244x122x2 cm) between the rafters and purlins.

5. Finishes and carpentry

Flooring: Cement concrete base with red colour oxide coat.

Outdoor walls: exposed bricks.

Indoor walls: lime plastering with natural finish (no painting or lime wash).

Carpentry: Windows & doors frames in plantation country wood with wooden polish and with bison boards.

6. Eco features

Rainwater harvesting: collection of all rainwater from roof tops within courtyard into a 12000 litre underground sump tank inside courtyard. This water will be filtered and used for washing and drinking.

Sanitation: DEWATS with anaerobic baffled reactor within courtyard and 16 m² of constructed wetlands attached to the South-West perimeter of the building.

Electricity: Photo voltaic panels on the South terrace of block B (West) that recharge batteries placed in technical room. These batteries will give power to most lights (energy efficient tubes and CFL) and fans energy-efficient in class rooms and office.