YANTRA

A COMMUNITY INTEGRATING WORKSHOPS & RESIDENCES
WITH
BAUBIOLOGICAL PRINCIPLES
IN THE
"INDUSTRIAL ZONE"

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YANTRA

Located on the north-east side of the Auroville Township, Yantra (4,500 m² plot area) is an attempt to combine small, non-polluting workshops with residences / offices in the "Industrial Zone". It was started in 1996 and has in the meantime, a weaving workshop (55 m²), a psychotherapy practice (45 m²), a multipurpose hall (75 m²), architectural studio (40 m² - under construction) combined with residences and guest facilities for 10-12 people. Fortunately it is one of the few projects in Auroville, which could be completed over the years, as had been initially planned in terms of density, built-form and landscape.

GUIDING PRINCIPLES:

- Creating a “landscape” of domes and vaults using a common language of elements such as large openings, deep overhangs and verandahs, while applying principles of BAUBIOLOGY, appropriate to the tropical climate.

- Experimentation with the “dome without ring forces” in Auroville.

- Respecting the existing canyon and indigenous species of trees already on the site, and designing and locating the buildings around them.

- A combination of individual and row units, planned with an integrated waste water and energy management.

APPLIED IDEAS & FEATURES:

- Since the south edge of the plot is formed by a canyon, it was decided to build the first 2 residences (1996-97) with compressed earth blocks (CEB with 5% cement) from the soil taken from there - at the same time landscaping the canyon by creating islands with the soil removed.

- Reduction of concrete by using construction techniques such as: 1. Domes without ring forces, which means ideally no ring beam necessary, 2. Vaults in brick and lime mortar, 3. Arches and granites instead of concrete lintels.

1. Baubiology or Building Biology addresses the resurgence of a decentrally oriented integration of MAN – NATURE – ECONOMY relationship. The need for creating a healthier, sustainable society is felt everywhere in the world today. Baubiology aims at a change by creating this awareness.

Baubiology is defined as the study of the impact of the built-environment upon the physical and mental health of the people, leading to the construction of healthy homes and work places. It is the science of holistic interaction between life and the living environment. Fabric, form the proportions, colours, scents and services must interact harmoniously with the inhabitants and the environment. Baubiology is not a narrowly specialized subject but deals with combining isolated fields of study like architecture, engineering, ecology, medicine, biology, chemistry, physics and geology, in its development and application.

Ref: 25 guiding principles of Baubiologie - Dr. Anton Schneider - Institute fuer Baubiologie und Oekologie (IBN), Neubeuern, Germany
The different lines of resultant forces in different dome forms.
- Building Research Laboratory, Kassel, Germany - Prof. Gernot Minke.

**Parabel** (Parabola)
**Stützlinie** (ideal line-without ring forces)
**Halbkreis** (semicircle)
**Kettenlinie** (catenary)

Compressive ring forces will be present when the line of resultant forces falls inside the ideal line.

Tensile ring forces will be present when the line falls outside the ideal line.
Using "bio-concrete" – with lime stones, available locally and broken by hand on the site, as an aggregate, instead of granite chips.

An electrical layout designed for each building keeping in mind the electromagnetic fields\(^2\) at places of rest and work – leading to a judicious combination of Direct current (DC supplied from photovoltaic panels and batteries) and Alternating current (AC supplied from the normal grid). This also helps in case of repeated power-cuts.

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2. Electricity has become a part of our daily life, which we cannot think away. In the past, or even up to today, electricity represented in the minds of many, with a certain right, a most safe and clean form of energy – easy to transport and use. It was only about 25 years ago that this image began to be questioned and doubted, through publications which stated that under certain conditions electrical and magnetic fields caused by electricity can lead to biological disturbances. This was of course received with indignation and disbelief, because it would stand in the way of technological "progress". This problem is done away with by declaring it as harmless or questionable. Official limits are laid down, in a way that they do not hamper the electronic industry. The fact is that the research for such official limits is carried out for too short a time and often on healthy and/or not so sensitive people such as the old, sick or children.

It is known that wherever there is a flow of electrons, i.e., electricity, there are electric and magnetic fields present. This is a basic characteristic of electricity. Electromagnetic fields thus created work on a subtle level and varies from individual to individual, making it difficult to objectify the whole subject. It is always the dose that matters. For example, it is known that our body needs certain minerals, proteins, etc. – but when taken in too high concentrations, they can turn into poison.

To study the different fields created by electricity, their possible sources and their biological effects, it is important to differentiate between direct current (DC) and alternating current (AC). This because all our bodily functions are controlled by infinite, small electrical impulses (at a minimal direct current) – each cell acting like a minute battery – which does not have a frequency as in alternating current. It should be remembered that our body, which is a very sensitive instrument, is made of 75% fluid (mainly water), which is a good conductor.

Ref: Does modern Architecture lead to civilisation - sicknesses?
Consequences of building technologies taken as a sign of progress in modern living - shown in case studies on Electrobiology - Masters Thesis - Mona Doctor-Pingel - ARTES, Flensburg, Germany
- Lime mortar and plaster with 10% of cement to give initial bonding strength.

- Overhead tank designed to fit solar panels on top - which provide lighting to 3 units and run a solar pump to pump from the underground to overhead tank.
- Solar water heaters wherever required – none of the units have electrical water heaters.
- Waste water recycled by a root zone treatment plant.
- A North-South orientation of all buildings in harmony with the earth magnetic field – also optimal for the wind direction.
- Windows designed with metal grill and mosquito mesh (termite proof; reduced use of tropical wood)
- Use of natural materials for finishing, keeping their radiation and electro-static fields in mind.
- Use of water bodies as reflection pools and for a better micro-climate.
- The spaces between the buildings carefully landscaped with rocks and plants requiring minimum water and maintenance, to create an integrated, harmonious environment.