

## **Types of Earth Construction**

All around the world mud is one of the primary building material for one third of the worlds population.

Although the type of construction differs from place to place as per the climatic conditions, the design of the structure becomes crucial to cater to the local needs. Recent shortage of resources has coaxed us to renew this long lost technique of construction in every continent known to man on earth.

Water is one of the biggest threats to this type of construction as against conventional kiln-burnt brick construction or cement or steel construction. Since rural people are the biggest users of houses build by mud, the technique used by them has remained more or less the same over the years, but with advancement in technology and eagerness of few concerned people to build a greener planet we have better, faster technology wherein compressed mud blocks (Compression Pressure - 39 kg/cm.sq.) or compressed mud walls are prepared which adsorb less than 5% water.

Type of Mud Architecture practiced all over the world can be broadly divided into 5 different types, although its important to note that, it excludes the style further developed by Nadir Khalil (Iran) and others.

### **1. Wattle & Daub Construction (Mud & Woven Stick Construction)**

Wattle & Daub is a building material used for making walls in which a woven lattice of wooden strips called wattle is daubed with a sticky material usually made of some combination of wet soil, clay, sand, animal dung and straw.

### **2. Rammed Earth Construction (pise-de-terre)**

Rammed earth construction is a simple technique wherein earth is compacted between formwork to make a homogeneous mass wall. It is a sustainable construction material, and it can be successfully designed and used in modern construction. Properly done, a rammed earth construction will create a building that is weather resistant, soundproof, insect and rodent proof, inexpensive to heat and cool, very comfortable to live in and will probably last for centuries.

### **3. Adobe Construction (Mud Blocks)**

Adobe is one of the oldest building material, and it is made from sand, clay and water with some kind of fibrous or organic material (sticks, chopped straw & dung) which is shaped into bricks using frames and then dried in sun over a period of time.

### **4. Cob Wall Construction**

Cob Wall construction is also one of the ancient type of construction wherein the Cob contains earth and straw or other fibers, which is very similar to adobe. Cob is normally applied by hand in large gobs (or cobs) for the building process

#### 5. Compressed Stabilized Earth Block (CSEB or CEB)

CSEB is commonly known as CEB, Compressed Earth Block, wherein mud, sand, silt & clay are mixed in an appropriate proportion which is put in a frame of block size 24 X 24 cm (other customized shapes are available with different machines), which are then compressed to a high pressure of 20 – 40 Kg/cm<sup>2</sup> to generate blocks.

CSEB is a new advancement over adobe construction and is widely used in New Mexico, America. The first CSEB Building code development happened in New Mexico, in 2001. Approximately 55% of all Indian homes still use raw earth for walls. But the irony being Earth is still considered as a poor man's material.

The machine used for compressing the mix is different for different places. Balram, Auram Press 3000 are used in India. These machines can produce different types of Interlocking blocks also, which are highly suitable for speedy and mortar less construction.

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