

Compressed Earth Blocks - Overview

By
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What are Compressed Earth Blocks (CEB)?

- Uniformed blocks produced by hand operated or hydraulic machines using a simple ingredient: DIRT
- Not a new concept. Adobe formed home has been in existence for hundreds of years
- Today CEB's is the new "GREEN" way of building.

What is CEB (cont.)?

- Traditional earth construction technology has undergone considerable developments that enhance earth's durability and quality as a construction material for low-cost buildings. Such methods include rammed earth, adobe, etc. (E.A.Adam)
- With the growing concerns about environmentally friendly (GREEN) construction in the areas of health and resources as well as the increasing cost of wood and the environmental concerns of fired brick and concrete products, a new source of building material is becoming increasingly important for the industry. (www.enviro-earth.com)

Earth and Building

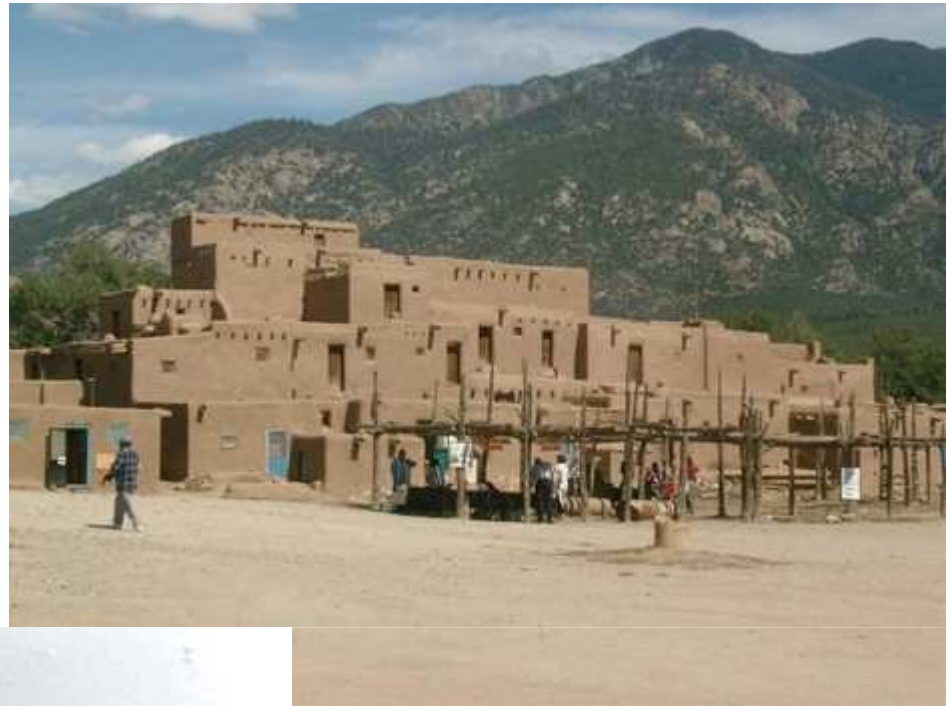
There's no earthen building in the world larger than the Great Mosque of Dienne in Mali, Africa. This mosque is one of the most famous landmarks in Africa and was built in 1907 (an earlier structure on this site was built in the 13th century). Bundles of deleb palm wood are embedded into the walls both for decoration and for use as scaffolding for annual repairs.

Great Mosque, the World's Largest Earthen Building



Image: Wikipedia

The Taos Pueblo is a historical adobe village in Taos, New Mexico – multi-storied buildings that have been continuously inhabited for over 1,000 years. It was probably built between 1000 and 1450 A.D., and as of 2006 it had 150 inhabitants.



www.enviro-earth.com



Images via: TravelBlog.com

Advantages

- Soil is easily available in virtually every community.
- Easy to use and construct with.
- Green and sustainable.
- Highly affordable. Especially in poor countries and cheap to transport.
- Proven durability. Look at the past.
- Little waste generated. Material re-use.
- Energy efficient and fire resistant.
- Non-stabilized wall could be used instantly, no transport or curing time required.
- Fire and mold resistant

Disadvantages

- Building officials usually fight it. Simply they do not know how to use it.
- Limited use in developed countries.
- Slower to build with when compared to wood construction.
- It's fought by business minded individuals.
- Some architectures don't believe in the product.

Characteristics

- CEB Block
 - Two kinds: stabilized and non-stabilized.
 - Stabilizing methods: cement, lime, tar...etc
 - Similar to adobe but much cleaner
- Higher density than concrete blocks
- Must be protected from moisture

Unlike Adobe....

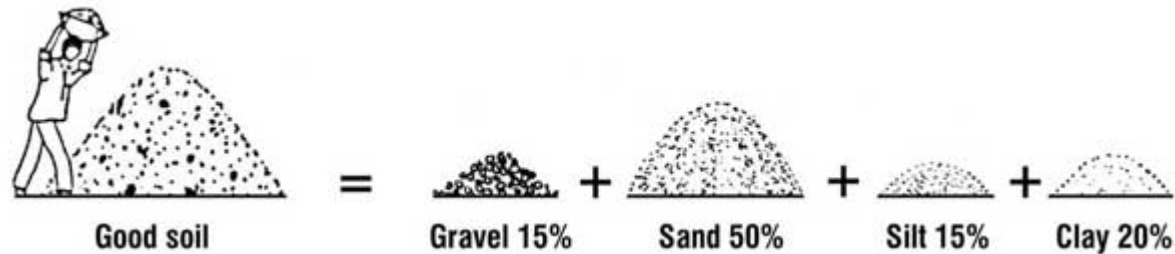
- No straw or mulch necessary
- Uniform blocks
- Strong
- No cure time



www.flickr.com/photos/25508232@N00/6184809

images via: WebUrbanist

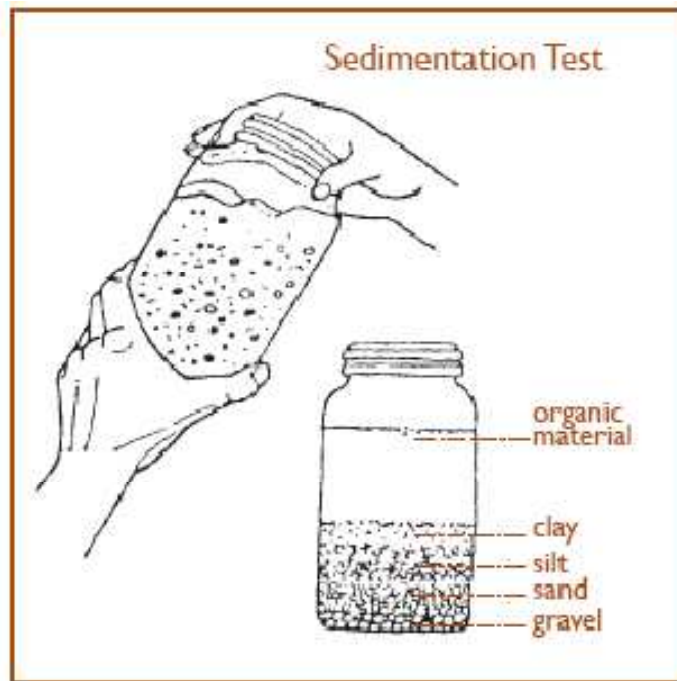
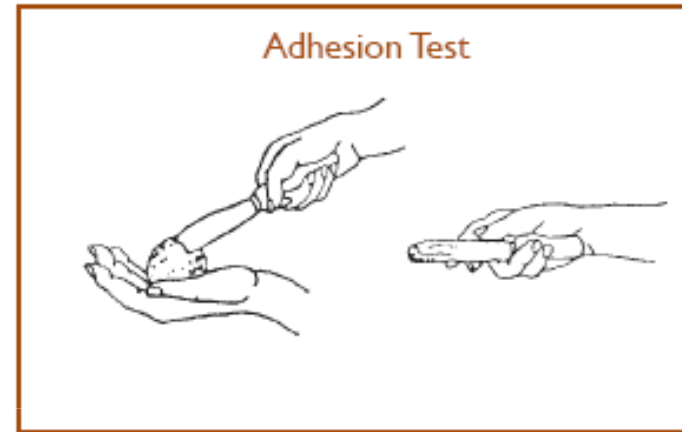
What are CEBs made of



- What makes a good block? Moisture content 3-8%. Too dry will fall apart, too wet makes a weak block.
- Sand is necessary to increase comprehensive strength.
- Straw is not required as it is mainly added to adobe for moisture reduction and since CEB hold low moisture adding straw will result in cracking.

Good Soil

Compact a ball of moist soil so that it does not stick to the fingers and insert a spatula or knife. If the spatula penetrates it with difficulty, and soil sticks to it upon withdrawal the soil is extremely clayey.



E.A.Adam

To form a general idea of the texture of the soil and the relative particle sizes of the different fractions

Good Soil

- Dry strength test
 - Form two or three pats of soft soil.
 - Place the pats in the sun or in an oven until they have completely dried.
 - Break a soil pat and attempt to pulverize it between thumb and index finger.
 - Observe how easy the pat is to pulverize.
- Implications:
 - If the pat pulverizes easily, the soil is silty or fine sand and has a low clay content.
 - If the pat can be crushed to a powder with a little effort, the soil is silty or sandy clay.
 - If the pat is hard to break and will not pulverize, the soil has a high clay content.



(Houben & Guillaud, 1994: p 52)

CEB Machines



Nils Gore

AECT Hydraulic Machines





AECT

In Action

How we build



Brocato, AECT

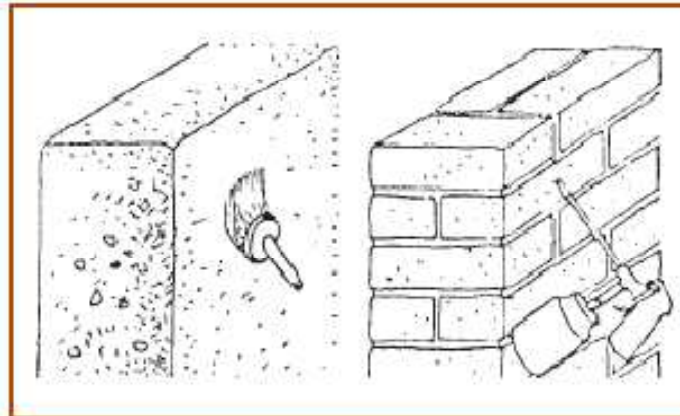
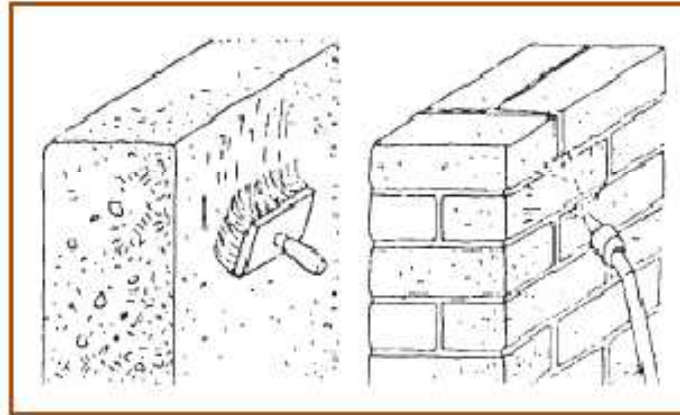


Brocato, AECT



Brocato, AECT

Finishes



Finished Product



Development of 57 dwellings ranging in size
from 1900 to 5000 SF in Arizona



Finishes



Brocato, AECT

Outside



Brocato, AECT



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Questions?

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