

# Walls: Stabilised Soil In-Situ Formed Walling

## Introduction

Walls constructed using this technology has proven to be stronger than the traditional 9" brick walls and more comfortable as the soil wall acts as an insulator. The walls are built between two cement stabilised soil block columns using a slip-form mould. The size of a room should be determined by the lengths of slip-form shuttering panels available. Panels come in lengths of 2', 4', 6', 8' and 10'. This technology has been adopted by Practical Action at its project site in Nikeweratiya, Sri Lanka.

## The Technology

- The soil should have a content of sand (50%), Clay (20%), gravel (20%) other 10% may be silt. It is imperative to test the soil.
- **Soil test:** remove the top soil up to about 6" (and store it for re-use). Soil below this 6" needs to be tested using any one or more of the following tests; (Undertake lab tests if there is any doubt).

## Sensitive Tests

### Visual examination

The dry soil is examined with the naked eye to estimate the relative proportions of the sandy and fine fractions. Large stones, gravel, and coarse sand are removed in order to facilitate evaluation. The fines fraction is made up of grain sizes with a diameter of less than 0.08 mm.



This diameter lies at the limit of the resolving power of the human eye.

### Smell test



The soil should be smelt immediately after removal. If it smells musty it contain organic matter. This smell will become stronger if the soil is heated or wetted.

### Nibble test



The tester nibble a pinch of soil, crushing it lightly between the teeth. The soil is sandy if it grinds between the teeth with a disagreeable sensation. Silty soil can be ground between the teeth but without giving a disagreeable sensation. Clayey soil gives a smooth or floury

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sensation and a small piece of it is sticky when applied to the tongue. Of course care should be taken that it is safe to place any such samples in the mouth.

## Touch test

After removing the largest grains, crumble the soil by rubbing the same between the fingers and the palm of the hand. The soil is sandy if a rough sensation is felt, and has no cohesion when moist. The soil is silty if it gives a slightly rough sensation and is moderately cohesive when moistened. The soil is clayey, if when dry it contains lumps or concretions which resist crushing and if it becomes plastic and sticky when it is moistened.



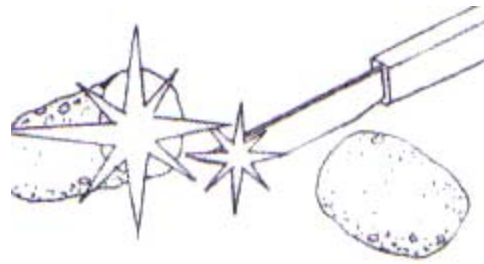
## Washing test

Wash the hands with the slightly moistened soil. The soil is sandy if the hands easily rinse clean. The soil is silty if it appears to be powdery and the hands can be rinsed clean without any great difficulty. The soil is clayey if it gives a clayey sensation and the hands can be rinsed clean only with difficulty.



## Lustre test

A slightly moist ball of earth is cut in two with a knife, if the freshly revealed surface is dull, the soil will be predominantly silty. A shiny surface on the other indicates the presence of a plastic clayey soil.



Source: Production & use of Compressed Earth Blocks – published by the Auroville Building Centre, India

- If the soil has more clay content, add sand to bring up to the required proportions.
- Add 20% cement (by volume) & thoroughly mix at least 3 times using a shovel.
- Water needs to be added to the above mix using a watering can

## The humid mixing

Sprinkle water on a dry pile



Mix again the humid pile



Sprinkle water and mix again to obtain a uniform colour and texture

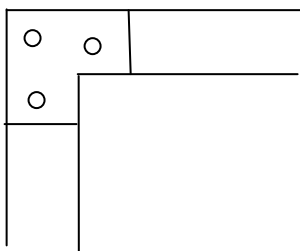


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## Moisture content test:

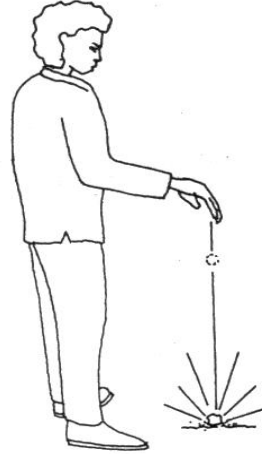
Drop a handful of the mix from a height of 1 mtr. Where the mix breaks into 4-5 small pieces, it indicates that the moisture content is adequate.

- The corners of the wall need reinforced concrete columns or reinforced stabilised soil blocks. Vertical reinforcement should connect to plinth beam as well as the ring beam at the wall plate level as indicated in the sketch given below;
- The maximum span between 2 walls should be not more than 12'. Any addition to the length of the wall should be made by first providing a masonry or concrete column.
- Concrete lintels maybe used as in conventional constructions or stabilised soil 'U-Block' lintel bricks can be used together with horizontal reinforcements.

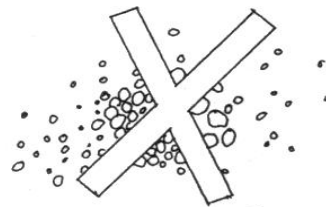


## Check the moisture content

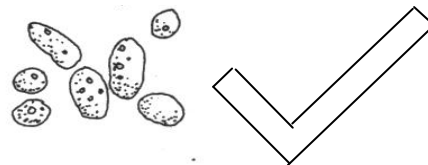
Let fall a squeezed ball from 1m high and observe the result



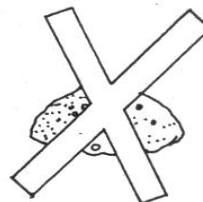
Not good ,The ball bursts a part: Too dry



Good,The ball bursts into 4 or 5 pieces:Good moisture content

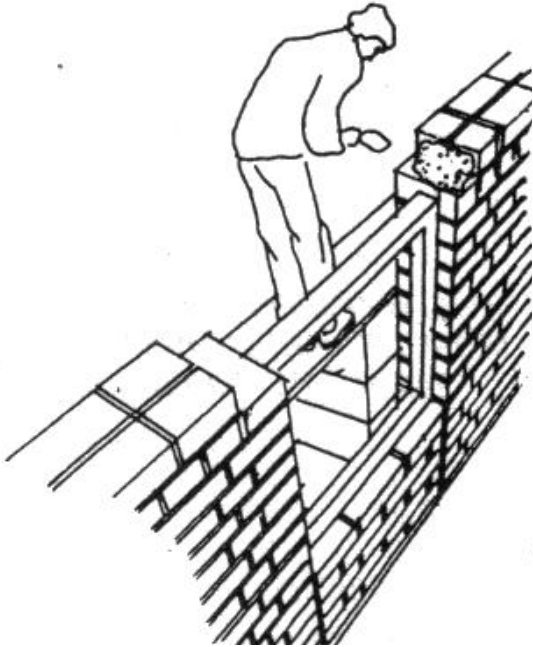


Not good,The ball does not break:Too wet

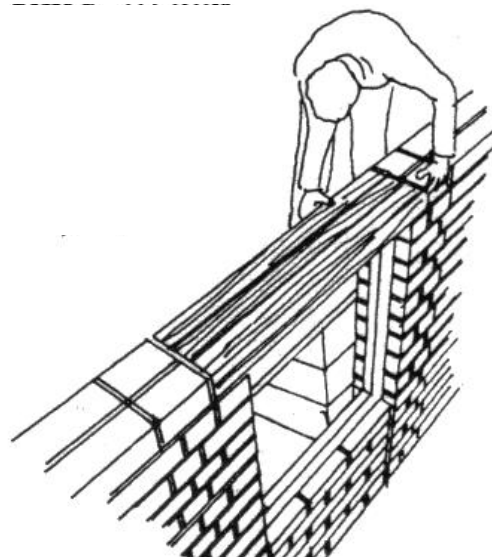


Source: Production & use of Compressed Earth Blocks – published by the Auroville Building Centre, India

## Window lintel



Wooden lintel but some mortar on the lintel course lintel



Adjust the lintel and check with the spirit

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