



MUD & LIME FLOORING

A technical document
detailing the process



The Hobbit Series

This workshop is a part of the Hobbit House series, held at the project's site in the spirit of upskilling the women workforce and labourers. As a firm, we believe in gender equality, with it being a core part of our efforts in uplifting women in construction and addressing the issues they face at the root level.

The Masons Ink team had an immersive mud & lime flooring workshop in Hosur under the mentorship of the principal architects. In this one day workshop, the team got to try their hand at the technique of mud & lime flooring. This is a document detailing the technique and process attempted.

Hosur, India
August, 2022

I N T E R N A L W O R K S H O P

MUD AND LIME FLOORING



A type of natural flooring consisting primarily of mud which is stabilised using lime. It is laid on top of a prepared sub surface.

1. Preparation of sub-surface:

For this structure, two methods of sub-surface preparation were done after the completion of the stone and lime mortar plinth.

The first method used a mix of mud and Msand in a ratio of 1:1 with jalli stones. This was compacted to obtain an even surface.

The second method used a mix of lime and Msand in the ratio of 1:3 with jalli stones. It was then compacted to obtain an even surface.

The sub surface is brushed once to ensure there is no debris or organic matter.

2. Fixing of Formwork:

Wooden planks cut to desired size are hammered and nailed into place such that it is aligned along the boundaries of the subsurface that the flooring mix is to be poured over. This is so that the mix can be poured evenly without any spilling.



Cutting of planks



Aligning of formwork



Finished formwork

3. Preparation of mix

Materials:

1. Surkhi
2. Lime
3. Sand
4. Aggregate
5. Water

1	1.5	4	9
Lime	Surkhi	Sand	Aggregate

Method:

1. Sieve sand and surkhi to obtain particles of uniform size and set them aside.
2. Slake one part of lime by adding water and wait for the slaking process to be completed. The slaking should take place in a metal heat resistant container or in



the funneled center of a pile of mud or sand as this process generates a lot of heat. Appropriate safety measures should be employed in order to avoid getting burnt.
3. Keep aside separate quantities of 1.5 bandlis surkhi and 9 bandlis of fine aggregate.



Slaking of lime



Adding and mixing surkhi and fine aggregate in small batches



4. Mix the sieved sand and the slaked lime by folding the mixture thoroughly so that an even mix is achieved. Stomping on the mixture with rubber boots helps in even mixing.
5. At even intervals of the above step, add in small batches of surkhi and fine aggregate to the mixture of lime and sand and continue to mix until a homogenous mixture is achieved.



Stomping the mix



Folding the mix with a hoe



Finished mix

4. Pouring of mix

The mix is gathered in bandlis. Handfuls are taken and flung onto the sub-surface. Using gloved hands, it is then spread throughout and patted to obtain a semi-levelled surface. Care is taken to ensure the mix is evenly poured especially along the edges and the corners.

Slaking of Lime: The process of adding water to calcium oxide to produce calcium hydroxide is referred to as the hydration process or lime slaking.
 $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{heat}$ is the reaction involved



Pouring the mix



Spreading the mix



Application and spreading of the mix

5. Ramming

The mix is rammed using wooden rammers. Care is taken so that the ramming does not displace or push out particles in the mix.

6. Levelling

By running gloved hands over the surface once more, any irregularities are smoothed over.

7. Drying

The surface is gently covered with a tarp and allowed to dry. It is cured by pouring water over and mopping it



Dried surface of mud flooring



POINTS TO NOTE

During step 1(preparation of sub-surface):

- According to the condition of soil present at site, appropriate measures should be taken towards termite and insect proofing. Capillary action of water should also be prevented.

During step 2(fixing of formwork):

- Connecting pieces of planks used to join two plank lengths must be nailed on the outer edge.

During step 3(preparation of mix):

- Slaking of lime is an exothermic process and appropriate precautionary measures should be taken to ensure safety of participants.
- Mixing of jalli stones should be done evenly to avoid formation of lumps of the stones visible in the mix.

During step 4(pouring of mix):

- When applying handful of the mix into the framework, it should be applied in equal amounts to prevent the formation of lumps or uneven levels.

During step 5(ramming):

- The process of ramming can cause the formation of air bubbles in the mix. Sufficient force should be applied so that these air bubbles are removed.
- The ramming should also be done evenly to avoid formation of uneven levels on lumps in the surface. This can occur when the pressure applied throughout varies.

After step 7(drying):

- As the layer dries cracks can form on the surface. These cracks are fixed by rubbing over the area to scoop out an even portion and then filling the gaps with fresh mix of the same.



Material Checklist:

Wooden planks
Lime (Shell or Rock)
Sand
Surkhi
Jalli stones 20mm
Water

Tool Checklist:

Saw (2-3)
Nails
Hammer (2-3)
Protective gloves
Bandlis (3-4)
Hoe
Buckets (1-2)
Trowel (2-3)
Wooden Rammers (2-3)
Rubber boots
Tarpaulin



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