

The Mightily Muddy



Rammed
Earth!!

MicroManual

The Muddy Micromanuals are an invitation to the world of building with earth by four of the most ancient techniques known to (wo)man!



This is part 4/5 of the
Muddy Micromanuals!
By Sourabh Phadke.
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In life, there are two ways in which pressure can be applied: Static & Volatile



Imagine pressing
a nail into a
wooden block.
Static.



Now imagine
hammering a
nail into a
wooden block.
Volatile!

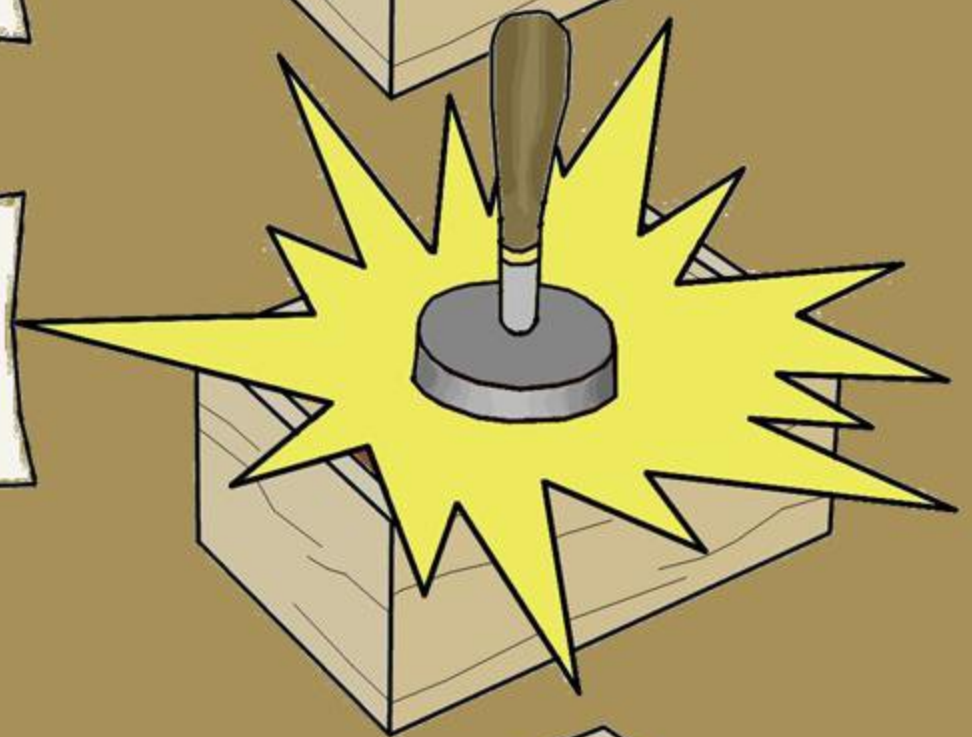
As you've probably guessed, volatile
compression is more effective!

Rammed earth employs volatile compression, and goes something like this

We pour some moist earth in a box



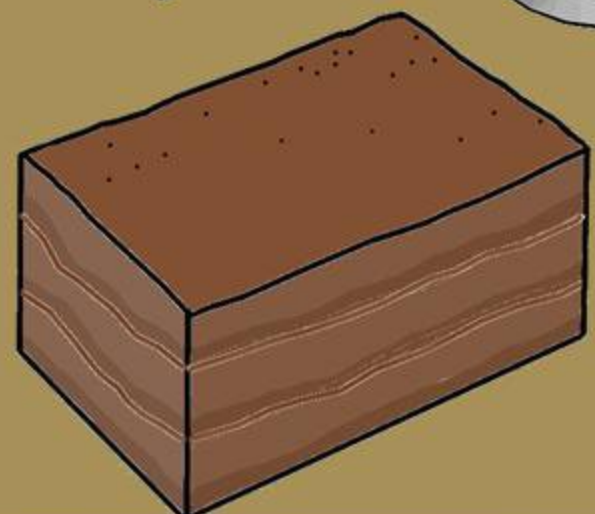
And compact it with a rammer. Hit it!



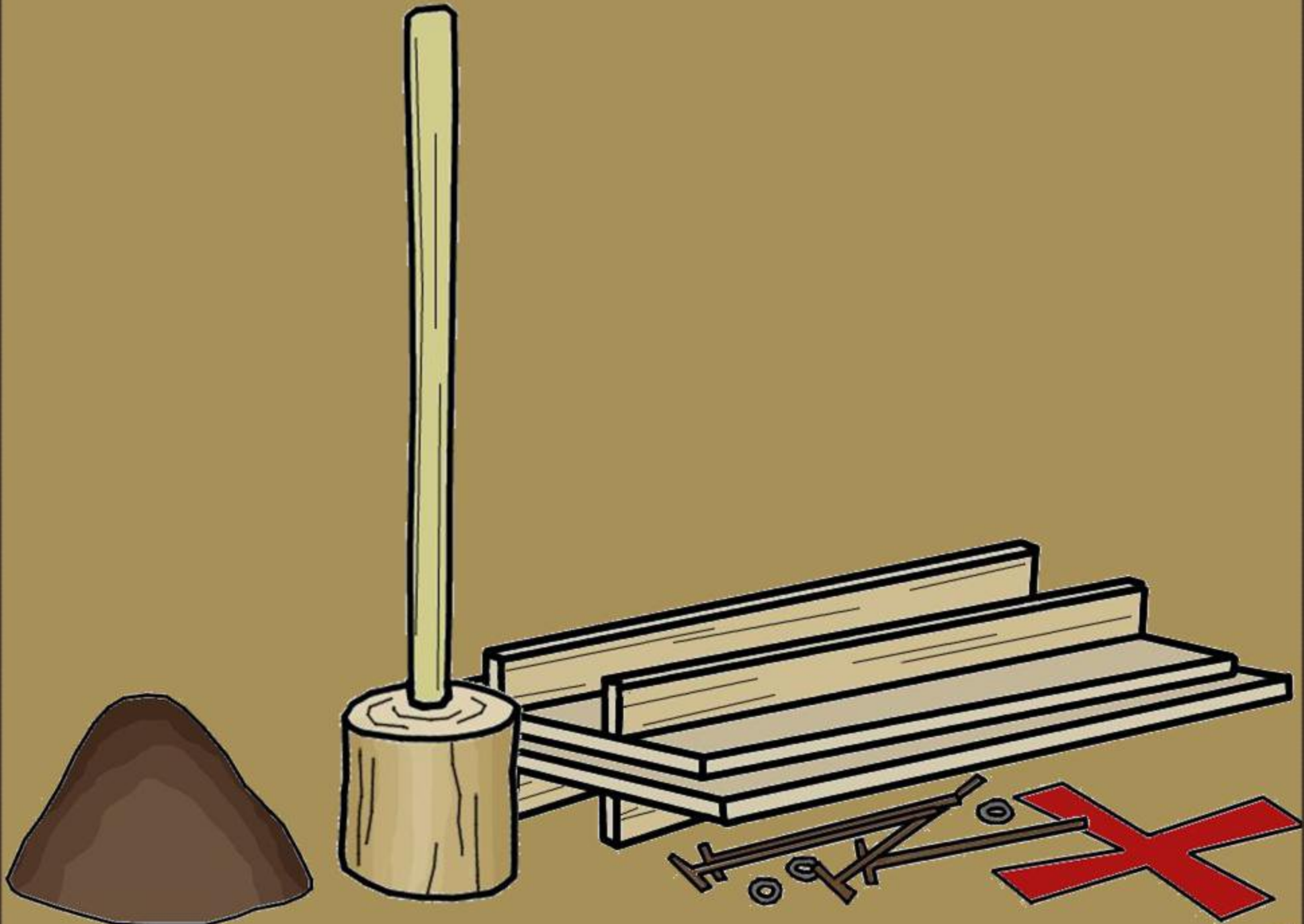
We repeat this in layers until the box is full



Then off with the box! Happy ending!



So as you can see, there are four stakeholders in the rammed earth story,



The
Mix

The
Rammer

The
Formwork

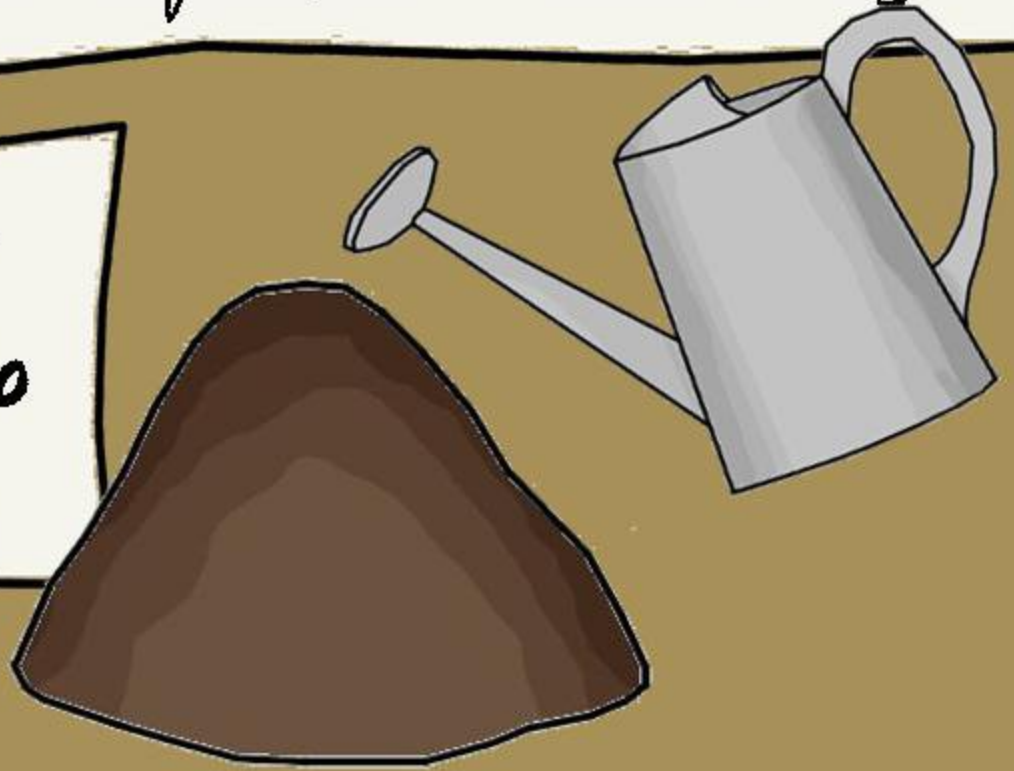
You stand
here.

Let's meet them one at a time...

The Mix

The mix used for rammed Earth is unlike most other techniques, it's almost dry!

We sprinkle water that's just enough to moisten the earth



Such that a handful when pressed forms a ball that doesn't wet the palm

And the ball when dropped from a couple of feet breaks into a few distinct pieces.



If the ball stays intact on being dropped, the mix is too wet! And if it gets shattered to smithereens, too dry!



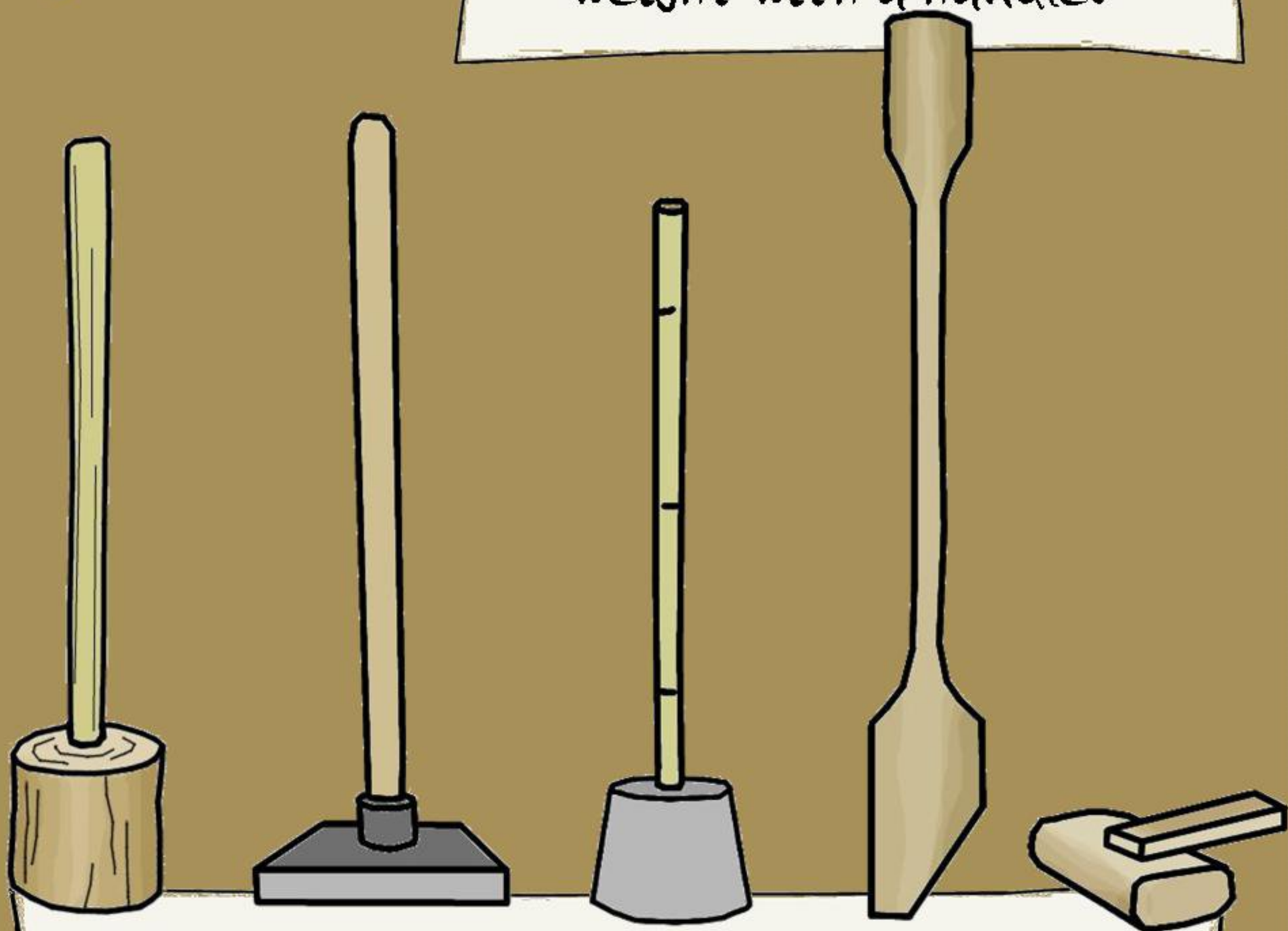
It's good to have a 'well graded' mix. Simply put, let there be all sizes of stones and pebbles in the mix!



It's very important to have a thoroughly homogenous mixture! Mix dry, mix wet and remix before you use the earth mix!

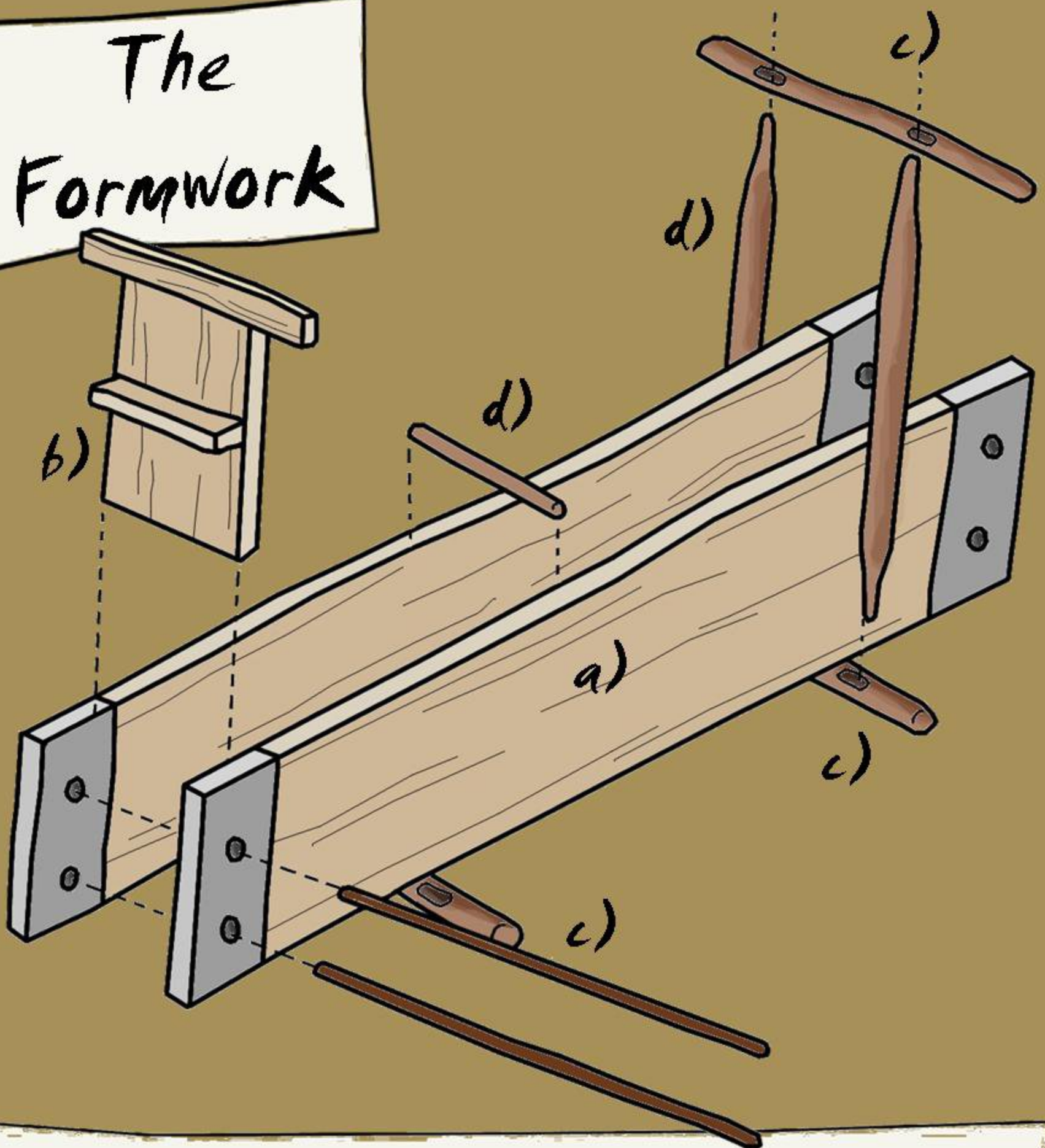
The Rammer

The earth mix can now be compacted with the help of a rammer, which is simply a weight with a handle.



It's really easy to make your own rammer. Always think of the user's height and weight before making one! It should be comfortable to use.

The Formwork



Here is a traditional wooden formwork that's simple and convenient to use. It consists of a) main planks, b) side faces, c) tie members and d) struts.

You.

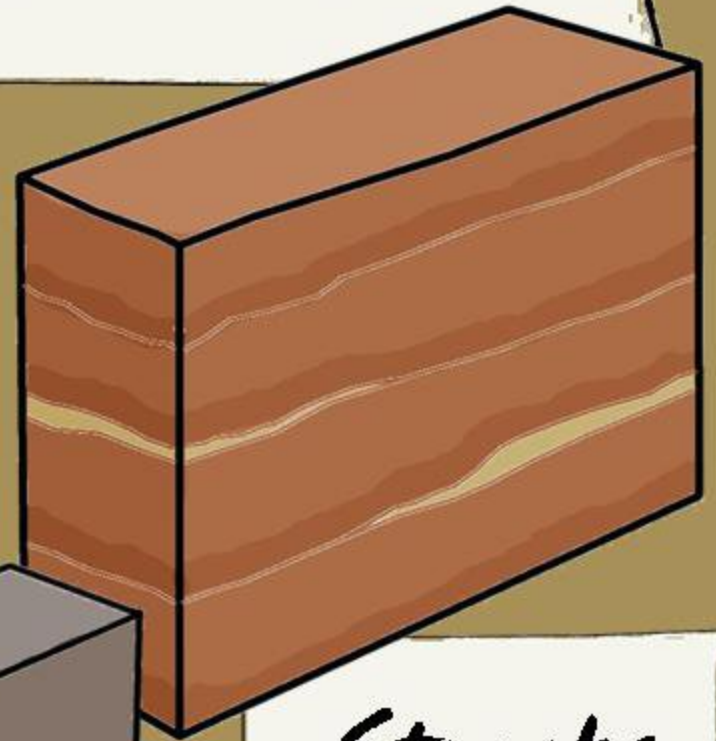
As for understanding the fourth stakeholder (which turns out to be the toughest bit), simply start spending more time with yourself...



There are so many ways in which we can play with the rammed earth elements



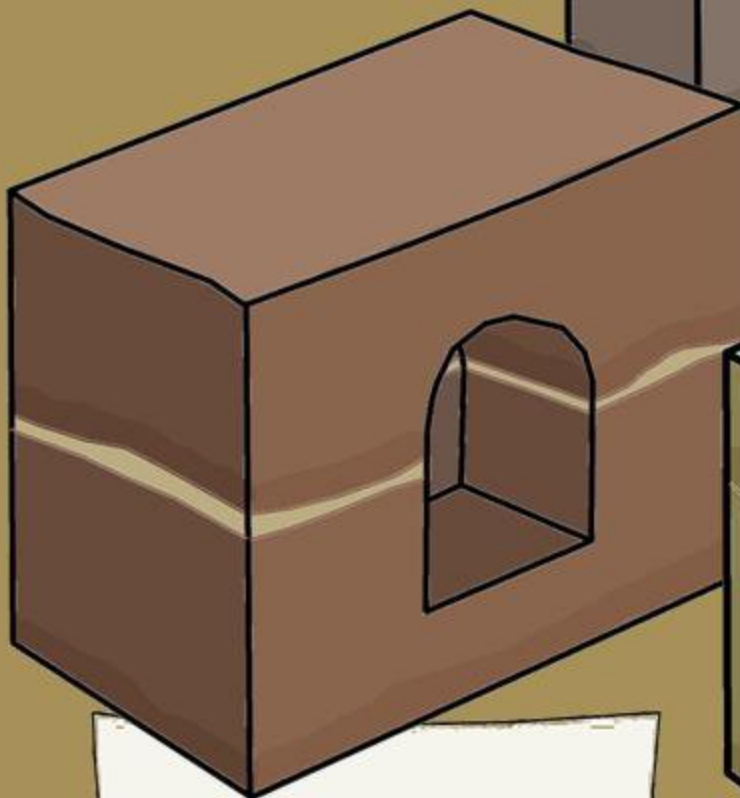
Textures



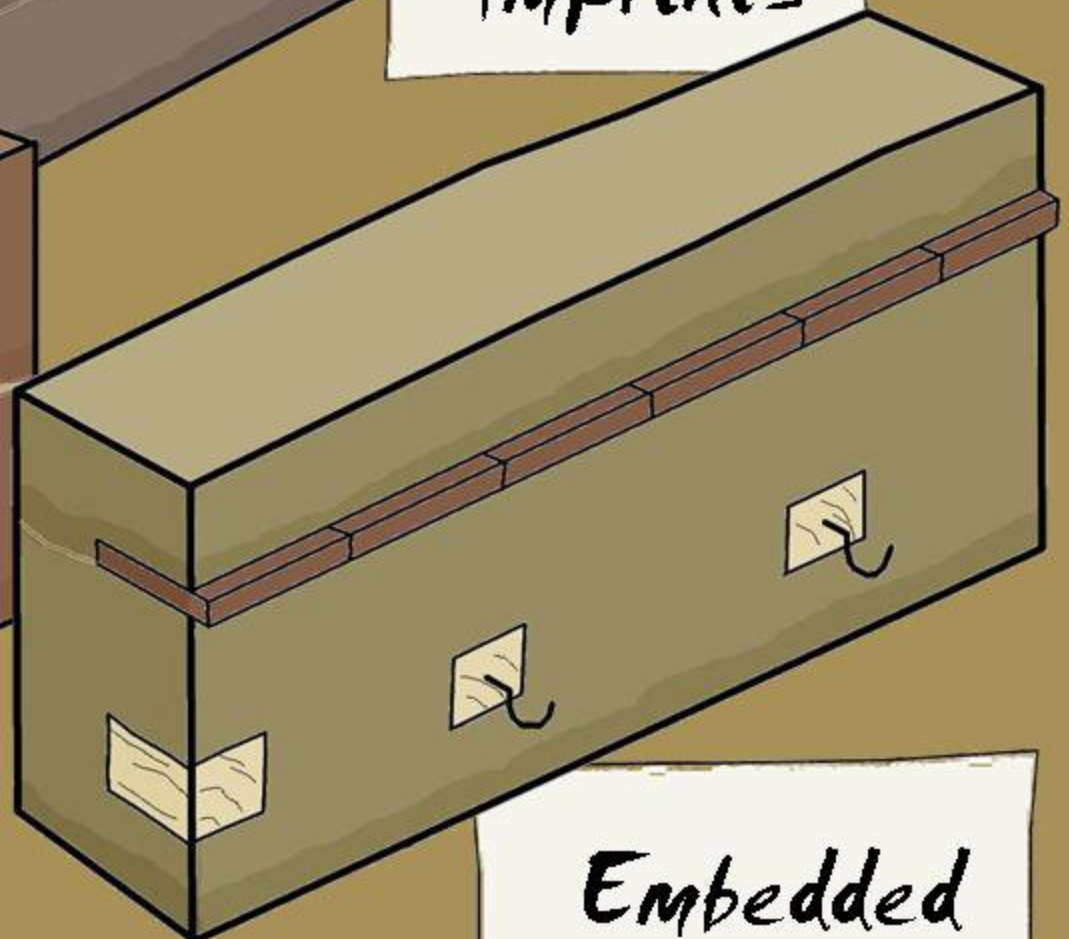
Streaks



Imprints

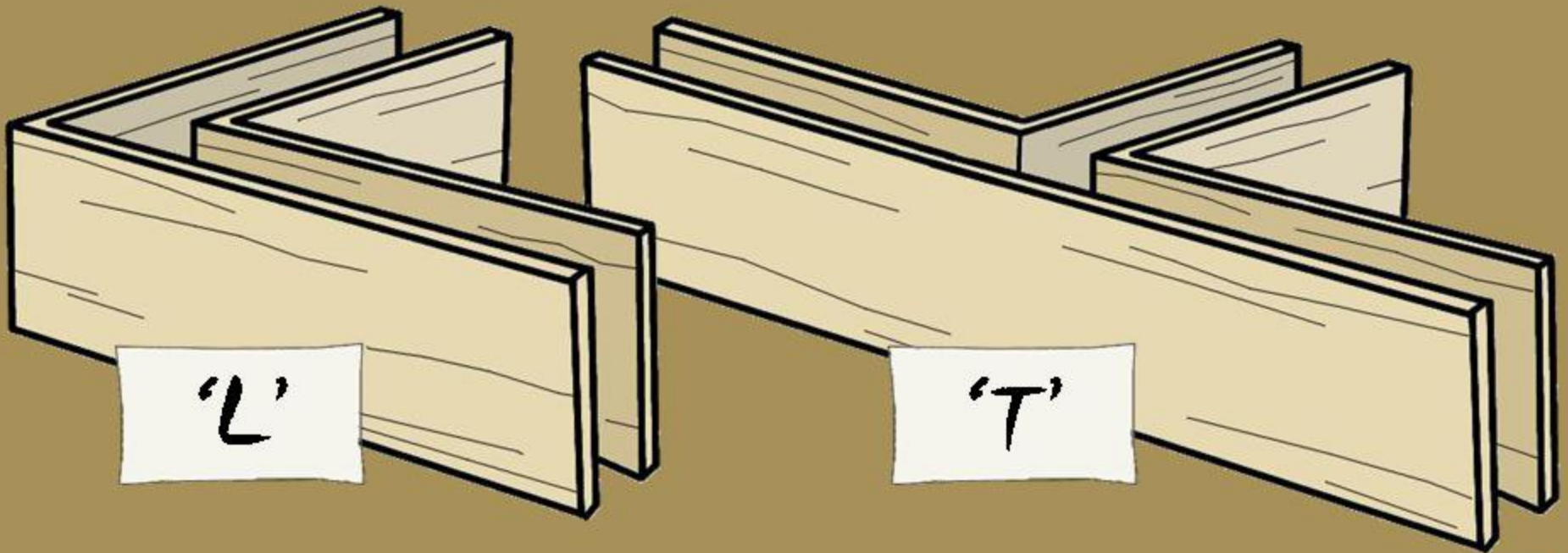


Niches & carvings

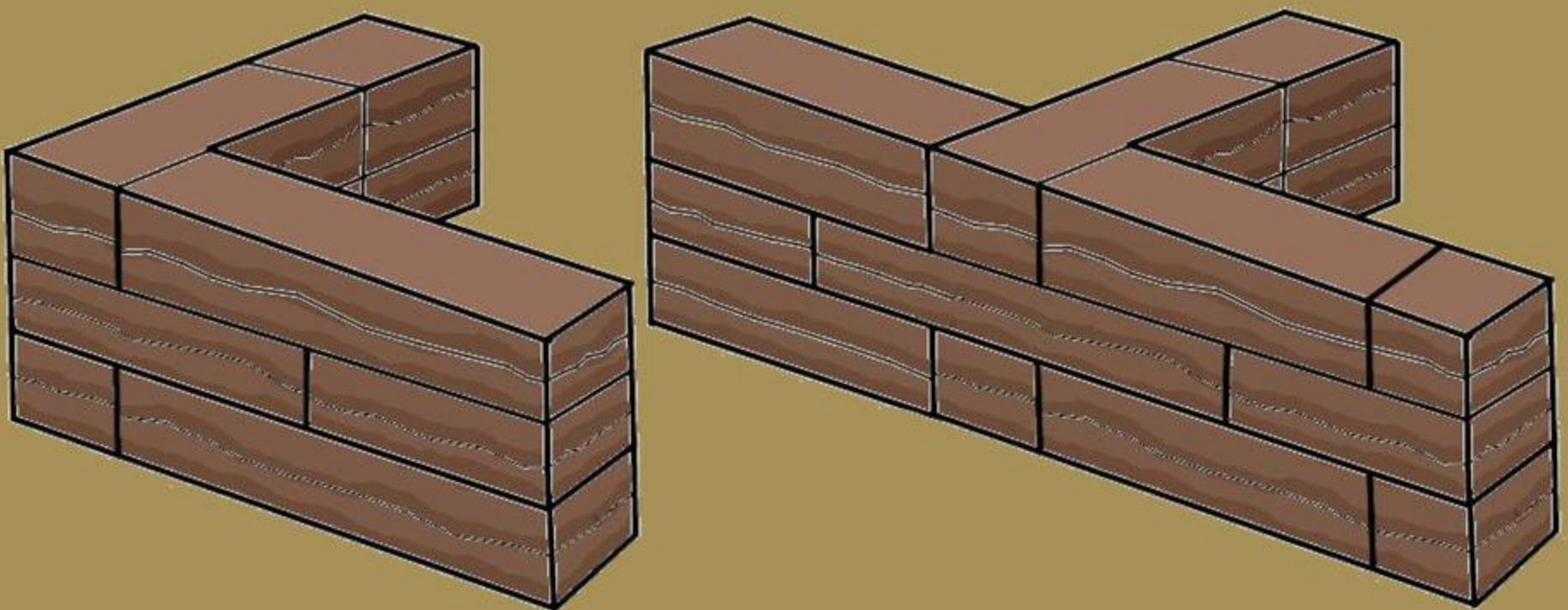


Embedded objects

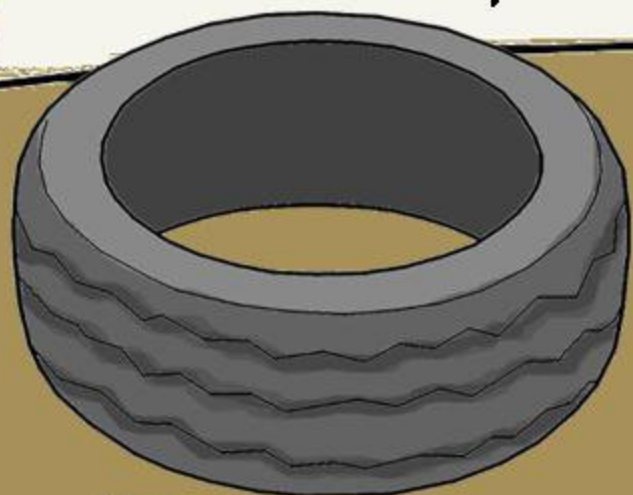
Ideally, you'd need three basic kinds of formwork for three situations: a straight wall, a 'L' formwork for corners and a 'T' formwork for a three way junction.



But you could also use a straight formwork and stagger the layers like masonry units!

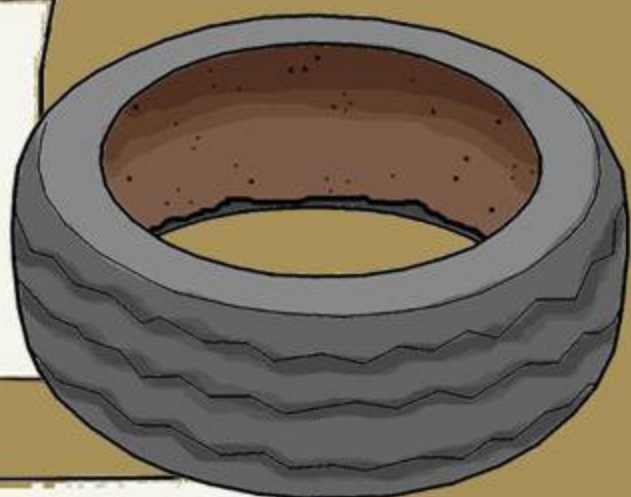


There are several variants of rammed earth which have appeared in the recent past.
One of which is Rammed Tyres!

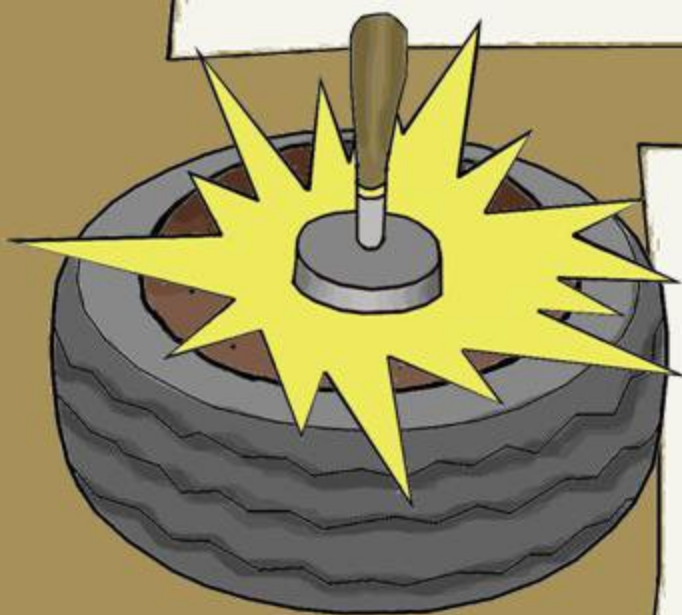


Take a discarded four wheeler tyre

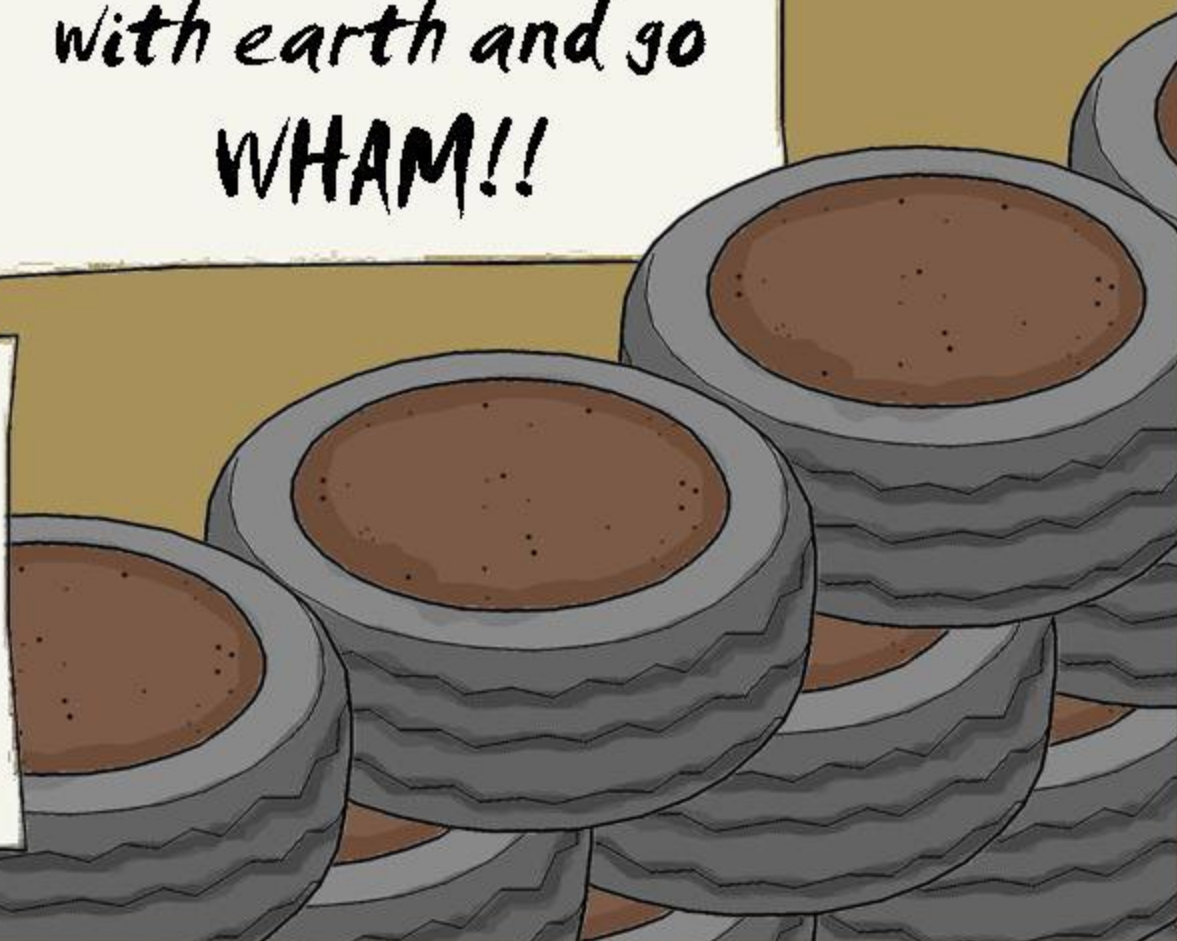
Ram the sides nice and tight with earth



Fill the entire tyre with earth and go WHAM!!



Go on and on, and up rises a wall!



Another is Earthbags!

Here we use discarded woven sacks as the flexible formwork!

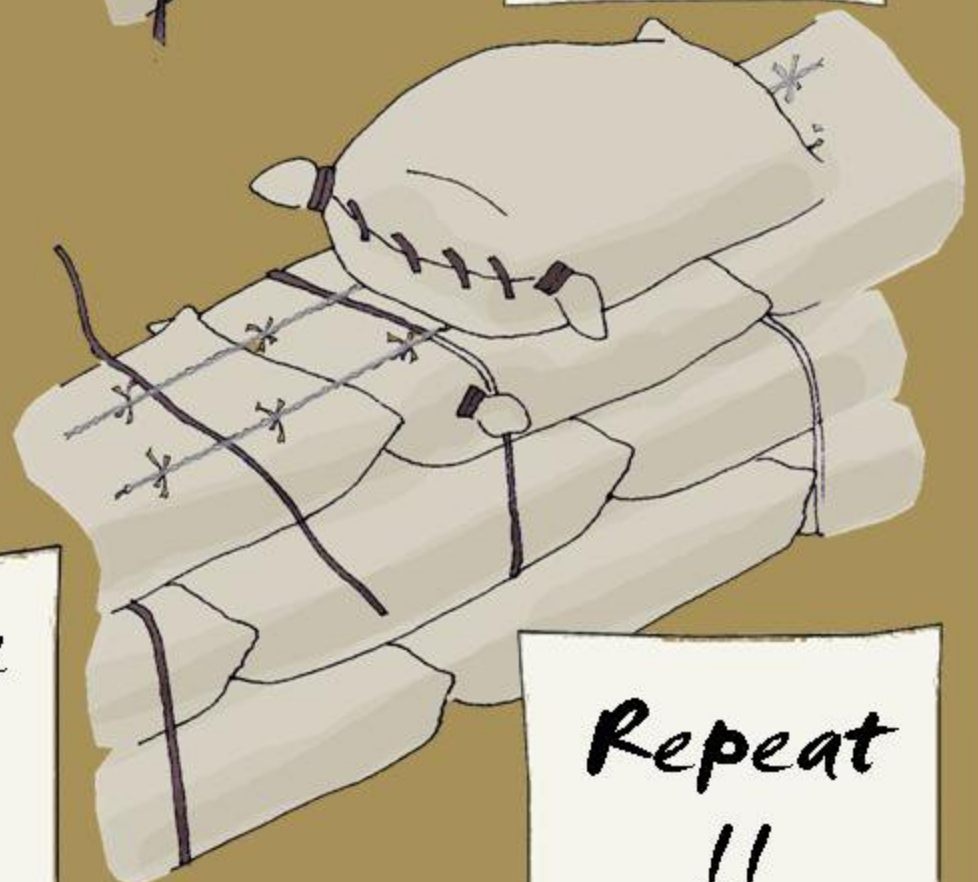
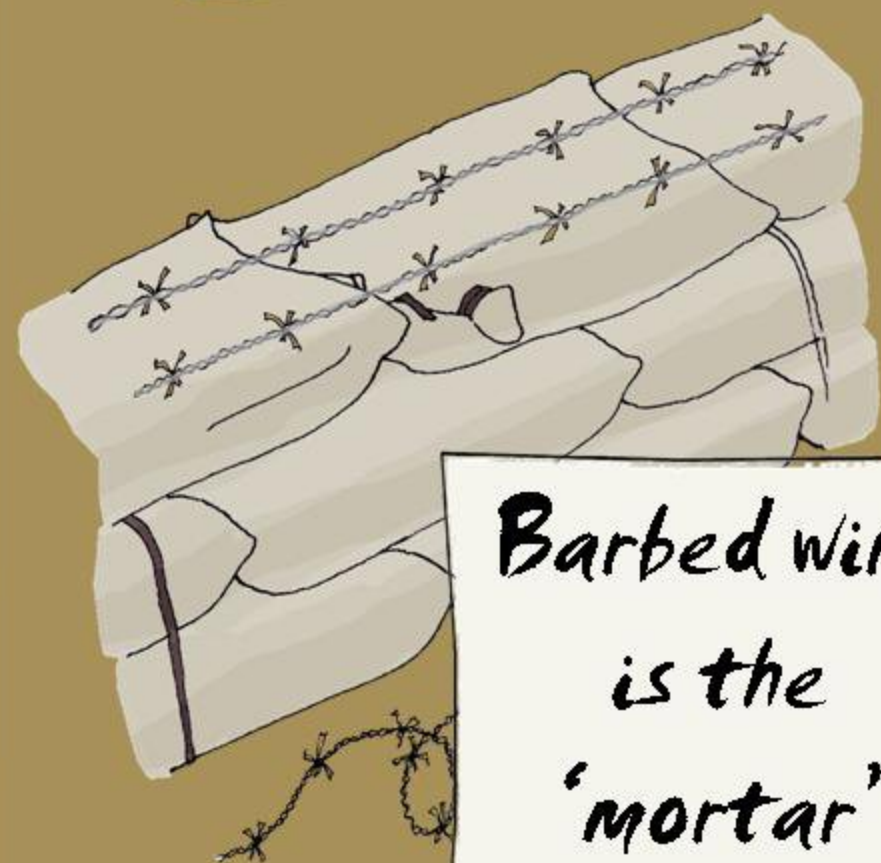
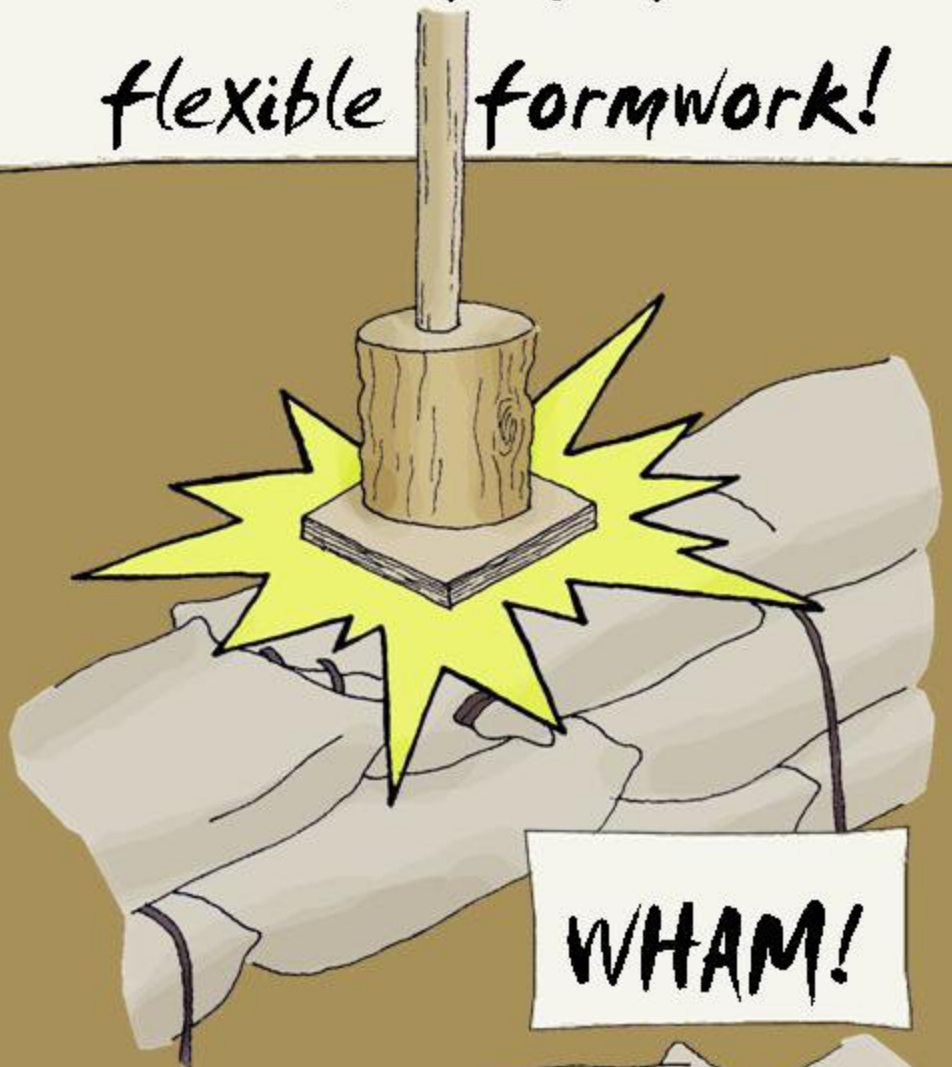
Fill a sack

Lay it

WHAM!

Barbed wire is the 'mortar'

Repeat !!





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