



TS2_MATERIALS SITE CASE STUDY INFORMAL MUD STRUCTURE KANDY, SRI LANKA

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This informal mud hut, which I encountered on my unit trip to Sri Lanka was built as a rest house for miners working for a gem mine in Kandy. The hut is constructed using materials available on site and makes use of waste materials from the mining process.

This vernacular process of construction involves building a timber frame and constructing the wall using adobe bricks in between the wooden posts. Bamboo struts are later introduced to support the structure further. Afterwards, the facade is finished with a plaster consisting of a mix of mud and cattle dung. A hole is left in the wall directly under the roof to allow air circulation and keep the hut cool.

MATERIALS

WOOD

Tropical hardwood cut from trees nearby is used. These trees are cut to construct the mine pulley systems and are used as firewood to cook. The trees are cut, trimmed into logs and dried out in the sun before construction. Wood is lightweight and abundantly available on site. The wood is good at handling tension and compression loads applied along where it naturally resists gravity in its life as a tree. Wood is bendable and can compensate for less precise methods of buildings.

ADOBE

The soil used to create the bricks is collected from the process of mining. This is considered a waste product and can be reused for construction. Earth is compressed into moulds and dried into adobe bricks. Adobe is good for hot climates due to its high thermal mass, it keeps the building cool during the day and radiates the stored heat during the night to keep the building warm. Adobe is weak against to torsional forces, so the wooden frame compensates for this weakness.

BAMBOO

Bamboo is abundantly available on site. It is cut and then dried. Bamboo is lightweight and has long fibres along its longitudinal axis. Bamboo has high tensile strength and can resist bending. Bamboo is used in the building to transfer torsional loads from away from the adobe to the wood and bamboo that can resist bending.

DUNG

The miners keep cattle as livestock on site as they have a small farm near the mine and dung can be claimed from the cattle. Dung can repel insects and provide a mosquito free environment inside the house. Dung also can be used to further thermally insulate the building.



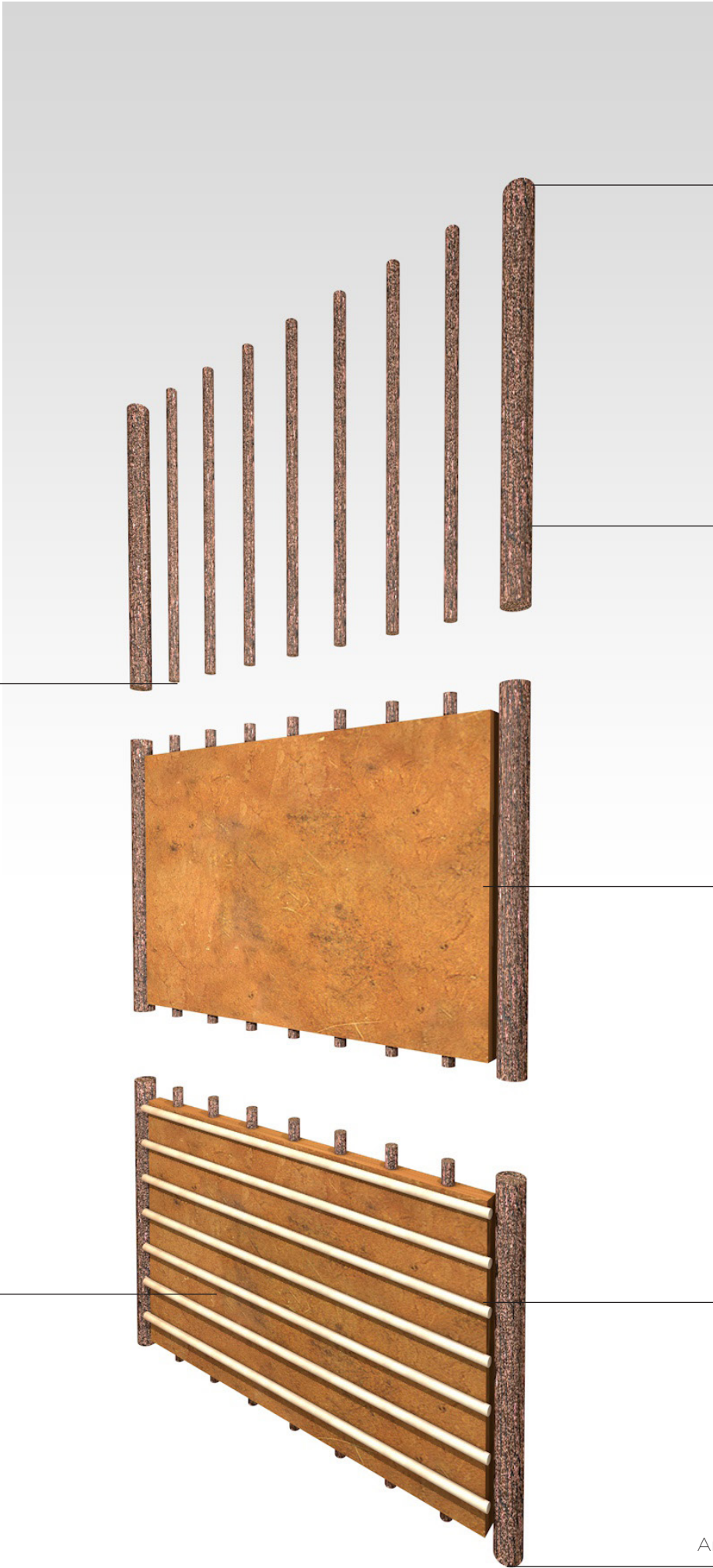
Mud walls are constructed using clay dug up on site from the process of mining gems. Growing plants brings an unintentional expressive quality to the facade.



Miners pull dirt up from the mine. The soil is washed to reveal gems.



Soil and clay is collected at the bottom of the washing pits after the water dries.



Timber frame is built using wood cut from trees on site

The wood can resist vertical and lateral loads at this stage as it is installed in the ground, like a tree

Thicker logs are used on the ends as corner supports

Thinner logs are used in between

Adobe bricks are constructed around this frame

The wall is plastered with a mix of clay and cattle dung

Structure is further supported by bamboo bracing

Around 12 cm thick