

Rammed Earth Bricks

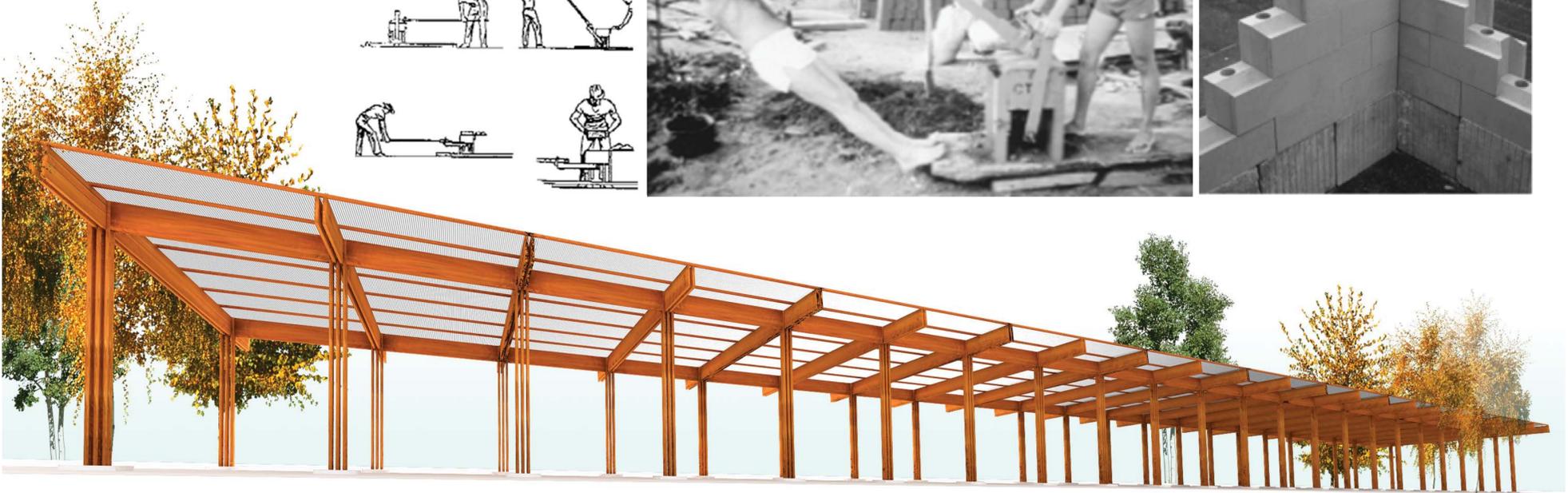
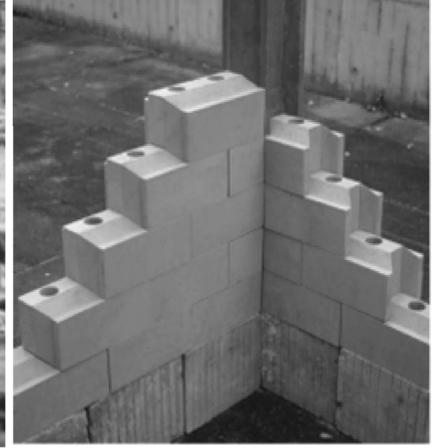
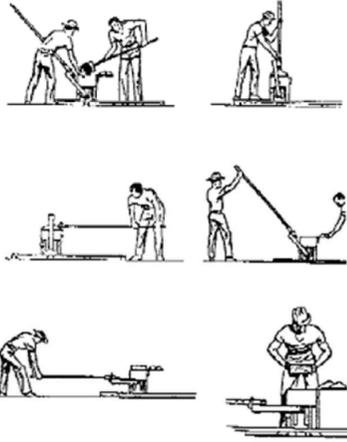
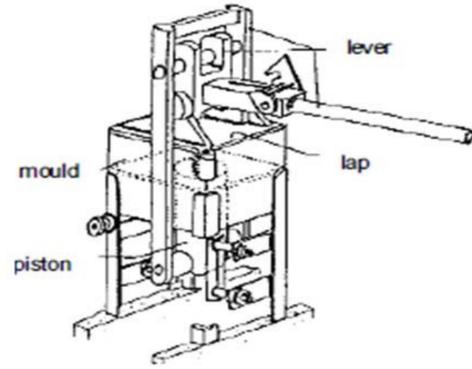
Considering the following design assumptions:

- _Proposed structure is located at a considerable distance away from the earthquakes epicenter (the location on the surface of the earth that is directly above the focal point of the earthquake)
- _Earthquake-induced displacement, does not exceed the design safety factor
- _Low probability of failure (i.e. probability of allowable displacement exceedance), etc,

Our choice of the rammed earth brick for the building of 'seismically sound affordable houses in Peru' is second to none, owing to its remarkable and outstanding properties. The use of the rammed earth bricks can be dated back to the late Bronze Age and Iron Age, from the eight century B.C on. Buildings made with sun-dried adobe bricks are common in the Middle East, North Africa, South America, Southwestern North America, and in Spain, its wide use being attributed to its simplicity of design and make, and the cheapness thereby in creating it.

Reinforced with straw, to compensate for the low tensile strength of the mud block, there improving the general (compressive and tensile properties) of the brick, rammed earth bricks have excellent thermal performance; the high thermal mass of rammed earth brick walls acting to naturally regulate the internal temperature of a building, and the relative humidity also, thus producing an improved air quality.

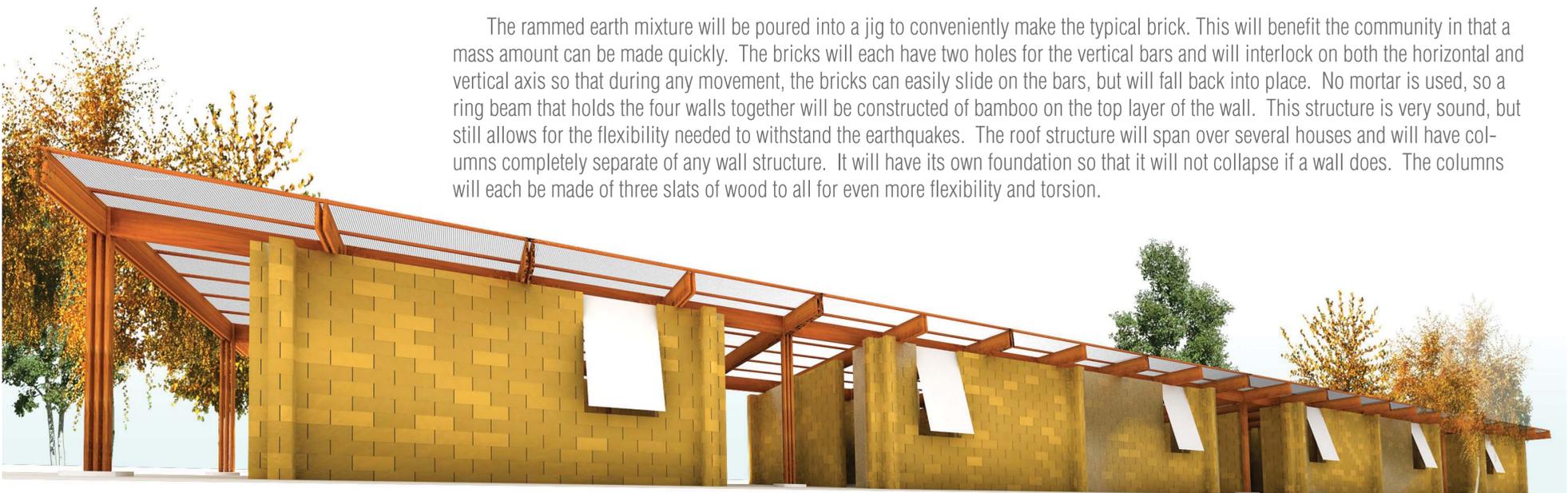
Although the strength and stiffness of the brick reduces with increasing water content, the structural performance of the sun-dried rammed earth brick wall cannot be doubted, having an un-stabilized strength close to 1MPa, the walls are perfectly able to act as load bearing members within a structural system as well as withstand horizontal loads created by seismic activity. Our proposed "seismically sound structural solution", complies with Building regulations for Insulation, strength, water resistance, fire and acoustics, since rammed earth brick walls possess great Noise Reduction qualities and are environmentally friendly.



Freestanding Roof Structure

Construction

The rammed earth mixture will be poured into a jig to conveniently make the typical brick. This will benefit the community in that a mass amount can be made quickly. The bricks will each have two holes for the vertical bars and will interlock on both the horizontal and vertical axis so that during any movement, the bricks can easily slide on the bars, but will fall back into place. No mortar is used, so a ring beam that holds the four walls together will be constructed of bamboo on the top layer of the wall. This structure is very sound, but still allows for the flexibility needed to withstand the earthquakes. The roof structure will span over several houses and will have columns completely separate of any wall structure. It will have its own foundation so that it will not collapse if a wall does. The columns will each be made of three slats of wood to all for even more flexibility and torsion.



Adobe Brick Enclosure

Single Unit
(Up to 4 People)

Double Unit
(Up to 8 People)

Communal
Kitchen



Section Perspective