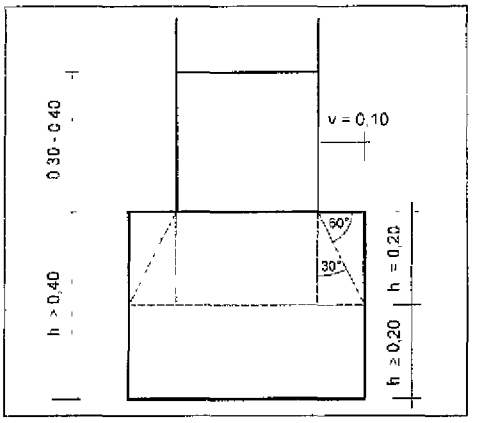
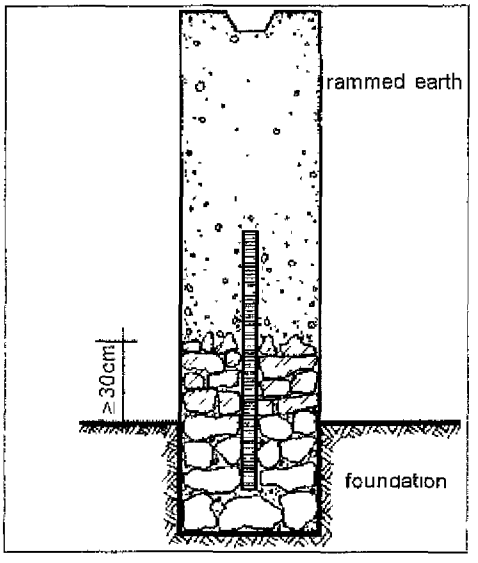
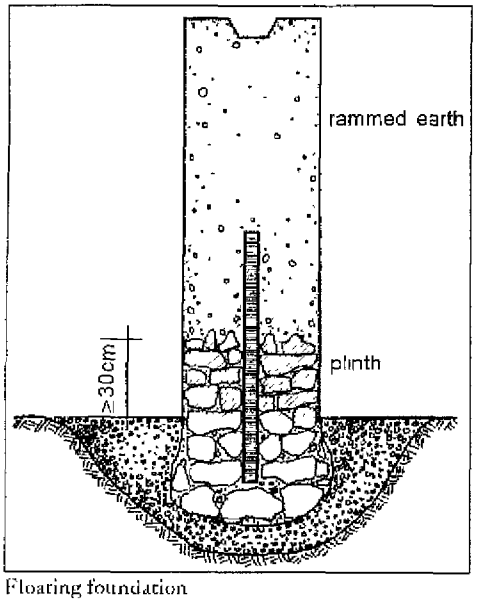


10-1 Foundation of external walls



10-2



10-3 Floating foundation

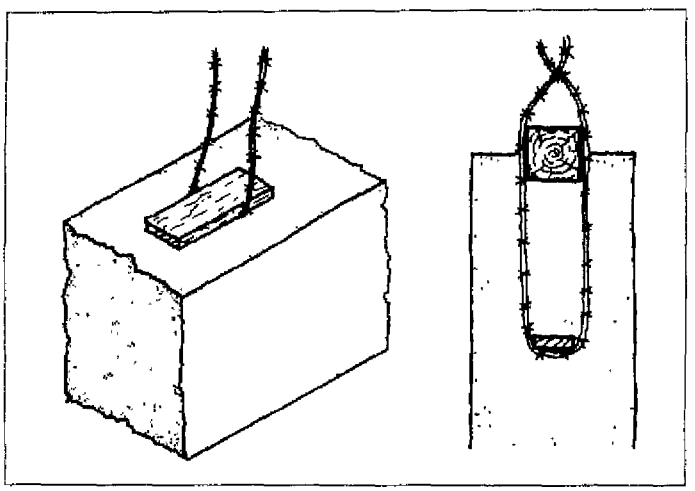
10. Critical joints and elements

10.1 Joints between foundation, plinth and wall

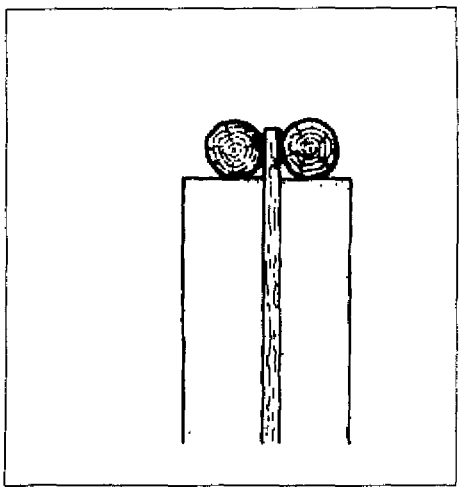
For a wall 30 to 40 cm of thick the foundation should usually be 20 cm wider and 40 cm or more high, see Fig 10-1, depending on the rigidity of the soil With a 50 cm thick rammed earth wall the plinth and foundation can be of the same width. The plinth is usually built of rubble random stone or bricks, but can also be of concrete with large stone aggregates. As it shelters the wall against splashing rain water, the height should be at least 30 cm. The joints between foundation and plinth as well as between plinth and wall have to have a good bond in order to be able to transfer shear forces. They should be situated every 30 to 50 cm. The easiest solution is to integrate a vertical wooden rod and to create a rough plinth surface , see Fig. 10-2. In the case of adobe walls the mortar must have a very good adhesion and a high bending strength. Horizontal damp-proof courses will interrupt the necessary bond.
A proposal by the author, not yet tested, is a "floating" foundation created by a channel of round pebbles which reduce the kinetic energy of the horizontal shocks, see Fig. 10-3.

10.2 Ring beams

Walls always have to be kept on top by a closed ring beam, which must be able to take bending loads when there are lateral forces against the wall. In order to prevent the walls from buckling and

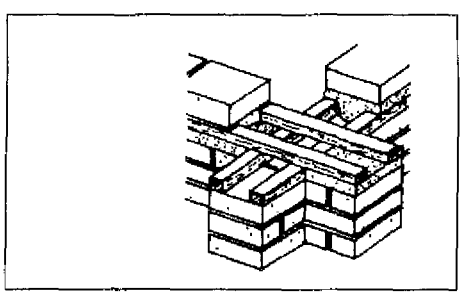


10-4 Fixing of ring beam



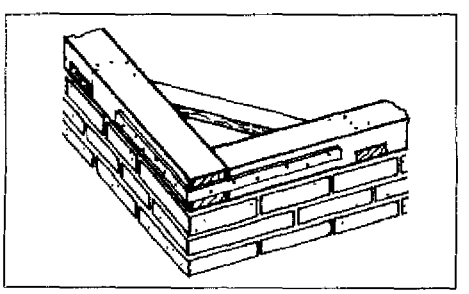
10-5 Fixing of ring beam

falling, the connection between wall and ring beam must be very strong. The ring beams can also act as a support for the roof structure. Fig. 10-4 shows one way of fixing a wooden ring beam to a rammed earth wall. A better solution is shown in Fig. 10-5 and 10-21, where a vertical interior reinforcement element of wood or bamboo is fixed to the foundation at the bottom and to a double ring beam at the top.



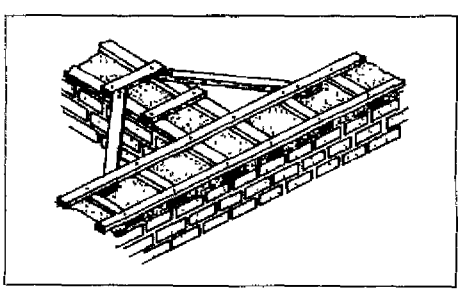
10-6

With adobe walls without vertical reinforcement elements it is not so easy to obtain a good bond between the masonry work and the ring beam. In the case of a reinforced concrete ring beam it is necessary to leave the last layer of adobes with open vertical joints so that the concrete will go into the gaps. In the case of adobe walls, if the ring beam is made from timber, as seen in Fig. 10-6, these elements must be covered by 2 cm of mortar with good adhesion values.



10-7

As corners of ring beams have to be able to transfer moments under seismic forces, they must be stiff. Figs. 10-6 to 10-8 and 10-12 show solutions for stiffening the corners for timber ring beams, while Figs. 10-9 to 10-11 show solutions for reinforced concrete ring beams.



10-8