

Improvement of the adobe houses against prolonged exposure of water by flooding effect

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It is known that traditional adobe walls collapse when exposed to the action of the water for long periods. However, in Peru adobe houses are often built on areas that are periodically flooded due to the increase in flow of rivers. This experimental research conducted a study of three techniques to protect the base of the adobe walls. The first one (wall MC) was based on replacing the traditional adobe base by simple concrete plinth (not reinforced); the second one (wall ME) was based on replacing the traditional adobe located in the area exposed to water by adobe stabilized with 5% of cement; and the third one (wall MT) protected the area exposed to water with a layer of cement mortar-sand (rendering) applied on a wire mesh attached to the traditional adobe.

The simple concrete plinth (MC) was the technique with best results at the base of the wall of conventional adobe with a higher cant of 30 cm than the expected water height. In this case, a rise in water by capillary action of 9 cm in the concrete that did not affect the adobes is noted. However, the cost of the wall doubled. To make it cheaper, studying the use of a cyclopean concrete slab or masonry industrial clay is necessary.

If a solution, in accordance with the Peruvian economic reality, is searched, it is concluded that, of the two remaining proposals, the solution base rendering (MT) provides better results because of its lower rise of water by capillary action and less absorption of water, although its cost is 23 higher than the solution adobe stabilized (ME). The MT solution could be improved using a polished concrete rendering and applied to existing houses, while the ME and MC solutions only may apply to new houses.