

## Abstract

This research aims to improve the water resistance of vernacular house constructed with adobe brick through the use of environmentally friendly materials as an aggregate in construction. The natural materials used for improving water resistance of adobe house in this study were synthetic rubbers. The rubbers were processed and synthesized to have an adhesive property. When used as a construction materials, the rubbers would enhance the bonding of adobe bricks similarly to cement. The study focuses on the experiments regarding the physical and mechanical properties of adobe bricks mixed with synthetic rubbers. The processes of the investigation and experiments were as follows:

1. Investigate and determine the waterproof problems of adobe house at the site of Vongsanit Arsom Klong 15, Phatumthani.
2. Test and determine the mix proportions of adobe bricks mixed with synthetic rubbers for improving the waterproof ability of adobe house.
3. Test the forming efficiency of the conventional adobe molding in comparison of the Lock Block molding.
4. Test the density indexes of the developed adobe bricks formed by the conventional molding in comparison of that formed by the Lock Block molding.
5. Test the shear wall constructed with the developed adobe bricks formed by the conventional molding in compare of that formed by the Lock Block molding.
6. Test the load-bearing capacity of the developed adobe bricks with reference to the Thailand Industry Standard (TIS) for hollow-core brick.
7. Test the waterproof ability of the developed adobe bricks in reference to The Australian Waterproof Standard for adobe brick.

In conclusion, by adding the synthetic rubbers in the mix proportions of adobe brick production can improve the waterproof ability. It was found that the developed adobe bricks, used as the main structure of adobe house, performed better in load-bearing and waterproof ability. This is beneficial for developing the adobe house architecture as an alternative to accommodate the Thai low income people in order to gain public acceptance.