1. ADOBE AND CLAY IN THE HOUSES’ WALLS

Examples of rammed earth and/or adobe used in traditional walls of houses can be found all over the world since the Neolithic.

a. We can see examples in Zaragoza province (a clayish central area in the Ebro valley, Spain).

b. The same system of “adobe” (土墼) in small houses can be found around the whole world, like in the south of Taipei (Taiwan).

c. In front of Taiwan, in the Province on Fujian (福 建), China, there are the World Heritage traditional houses called tulou (土楼, literally “towers of sand”), made also with “adobe”.

d. In modern Vietnam traditional techniques of construction still can be appreciated, not of adobe, but of big layers of rammed earth made with formwork:

2. CLAY IN FORTIFICATIONS AND CITY WALLS

Other traditional usage of rammed earth is fortifications, either to construct the walls of provisional forts of an army conducting a siege, or to replenish the central part of the wall of fortified cities. The work is usually done adding horizontally different layers of rammed earth.

a. In the first case we can mention a canonical way referred in the military architecture treatise of Sebastian Fernández de Medrano, El Arquitecto Perfecto en el Arte Militar (Brussels, 1700), where we can read the following:

   “Si el ingeniero fe hallare en parte que ayta Tierra á propósito para defensas...”

b. Other traditional constructions of clay earth are opened, like a kind of external platform (like the aboriginal house portrayed above), but a below foundation. In this sense other interpretations of prospection made by Liu Yichang (呂一常) in 1996, and published in 2010, p. 76.

c. Matching with these descriptions we have images of aboriginal structures that had appeared in our excavation in the aboriginal village of Quimaurri (Jilong, North Taiwan).

3. CLAY AS FOUNDATION OF WALLS IN TAIWAN

As far as we know, also the rammed earth is to be used as foundation of buildings or other structures, although this is less common. We have found several cases in Taiwan in different archeological surveys:

a. Under the Northern gate of the Qing city (1870)
   It was excavated by Chenghwa Yang (楊成華) in 1984, with occasion of the construction work of the subway of Taipei. Here we can see that different layers of rammed earth appear under the gate that clearly it works as foundation of the gate.

b. The naturalist Joseph Beal Steere, who made some trips of field work in southern Taiwan in 1874, talking about the houses of the Southern aborigines Tsinwahan said: “We were conducted to one of their dwellings, a large barrack of bamboo, covered with grass, and built upon a bank of earth, raised two or three feet above the common level.” (Formosans and its Inhabitants (edited by Paul Jen-kui Li, Academia Sinica, Taipei, 2002), p. 34)

c. Matching with these descriptions we have images of aboriginal houses in Formosa, rendered by Chinese artists in the 18th century that somehow correspond with our archeological findings:

4. CLAY AS PLATFORM UNDER NATIVE HOUSES

According to ancient documents and ethnographic records, the natives in Taiwan constructed their houses on a rammed earth platforms. Now we cite some of them:

a. The Atlas Chinensis of Arnoldus Montanus, translated by Ogilby and published in 1671 says (p. 24): “(The Formosan houses) generally stand six Foot from the Ground, on a Hill of Clay”.

b. The case study of Hoping Island: some answers and some questions
   The way of dealing with these archeological relics is still under discussion. Now preservation is the main action. We have covered it again using non-woven-cloth (布篷) before engaging in a second archeological campaign.

5. CASE STUDY: THE QUIMOURRI VILLAGE

We will like to draw your attention to a rammed earth structure that had appeared in our excavation in the aboriginal village of Quimaurri (Jilong, North Taiwan).

In 1626 this aboriginal village was encountered by the Spaniards when they arrived in Jilong from the Philippines. In total there were around 600 natives, meaning more than 100 houses. An archeological international team (NSC of Taiwan & CSIC of Spain) made an excavation in 2011 (to be continued until 2013) looking for the remains of the short lived city of San Salvador (established besides the native town) and of the village itself.

The most striking of the unearthed structure is the similarity with the above mentioned graphic and historical descriptions.

The structure was made with a formwork with posts every 3 mts. This structure might be one of the following two scenarios:

a. Aboriginal house according to the models of the images above. This possibility is supported for the existence of a fire place. This structure helps us to better presume the orientation of the house because: it will be located (1) at the back, and, for safety reasons (2) in the middle of the two the main walls, and (3) in the border of the house. Consequently, the main entrance will be in the opposite side, on the south, which precisely is the one facing the sea.

b. The main problem of this interpretation is that the stage is not a kind of external platform (like the aboriginal house portrayed above), but a below foundation. In this sense other interpretations are opened, like a Western structure using local technique.