

Mud – Vitruvius

Vitruvius (30–20 BC) *Ten Books on Architecture*. Translated by Rowland I D; eds Rowland I D & Howe T N (1999) Cambridge University Press.

Book 2 Building Materials

Chapter 3; Mud Brick Masonry

1. First, therefore, I shall discuss mud bricks, and from what type of earth they should be created. For they should not be made from sandy or pebbly clay, nor from loose sand, because if they are made from these types of earth, they will be heavy at first, and then, as rain spatters against the walls, they break down and dissolve, and the straw mixed in them will not hold together because of their unevenness. They should be made from whitish clay or red earth or even coarse sand. For these types of earth, on account of their lightness, have durability without weighing the building down, and they are easily piled together.
2. The bricks should be made in springtime or autumn, so that they dry at a uniform rate. For those prepared in midsummer are defective because when the sun has baked the outermost skin, harshly and prematurely, it makes it so that the brick looks dry when the interior has not yet dried. Then, when it later contracts in drying, it will shatter what has already dried. Thus these bricks are rendered cracked and weak. They would also be most serviceable if they were made two years earlier, as they cannot dry thoroughly before that time. If they are laid new and not entirely dry, then, when the plaster has been laid and remains there solidified, the mud bricks themselves, as they subside (in drying), cannot maintain the same level as the plaster, and as they contract they no longer bond with it, but instead pull apart at the join. Therefore the plaster, split away from the masonry of the building, can no longer stand by itself because of its flimsiness, but shatters, and the walls, having settled haphazardly, are themselves flawed. For this reason, the people

of Utica would use a mud brick in the construction of walls only if it were fully dry and made five years earlier, and approved as such by judgment of a magistrate.

3. Now there are three types of mud bricks. One, which is called 'Lydian' in Greek, is the one which we use, 1 ½ feet long and 1 foot wide. The Greeks construct their buildings with the other two types. Of these, one is called *pentadoron*, the other, *tetradoron*. For the Greeks, called a palm a *doron*, and that is always done by the palm of the hand. Thus whatever is five palms long in every direction is a *pentadoron*, and what is four palms long is a *tetradoron*, and public works are constructed with *pentadora*, private works with *tetradora*.
4. Along with these bricks, half-bricks are made, which are laid like this: rows of bricks should be laid on one side, and rows of half bricks laid on the other. Therefore, when they are laid on the level on each side, the walls will be tied together with alternating surfaces, and the half-bricks placed over the joins lend a durability and an appearance on each side that is not unattractive.

Book 8 Styles of Concrete Masonry.

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Brick Masonry.

16. If, therefore, kings of such immense power did not disdain structures with mud brick walls, kings for whom it was possible, thanks to tribute money and the booty of war, to have buildings in rubble work, or squared stone masonry or even marble, I do not think it necessary myself to look down on buildings made of (mud) brick masonry, so long as they are roofed correctly. I shall, however, describe that type of structure which it is not right for the Roman people to have made in the City, and I shall not neglect to mention what the causes and reasoning are for such a phenomenon.

17. The law does not permit greater thicknesses than 1 ½ feet to be reached in a party wall. All other walls as well, except on the narrowest of sites, have been laid to the same thickness. However, brick walls at (this thickness), unless they are going to consist of two or three layers of brick, cannot carry more than one story, whereas in a city of this grandeur and such endless density of population it is necessary to put up houses beyond number. ...the problem itself imposed arriving at the expedient of tall buildings. By the use of stone piers, tile masonry and rubble work walls, heights could be built up and layered (p42) with multiple stories...(restrictions of space therefore lead to an absence of mud brick buildings in the City)...

If the plan is to use them outside the City, this is how to make them flawless even into great age: On the tops of the walls tile masonry should be put under the roof tiles to a height of about a foot and a half, and let it project like a cornice. In this way one can avoid the usual defects that occur in this type of wall, for when roof tiles are broken on the roof, or blown down by the wind, in those places where water can pour down from the tiles, the terracotta armour will not allow the brick to be harmed. 19. Instead the projection of the cornice will cast the dripping water beyond the plane of the walls, thus preserving whole the brick masonry.