TÍTULO: ENSAYO DE DILATÓMETRO EN PAREDES DE OBRA DE FÁBRICA
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ABSTRACT

Nowadays, there are lot of buildings made of masonry walls, and so the concerning about the security and the behaviour's knowledge of this type of construction is increasing.

The peculiar behaviour of masonry is due to its structure, made of units as a bricks or blocks and joined by mortar. The different deformational properties of components, its compound character and the different kind of disposition for bricks are the reasons of the non linear, brittle and anisotropic behaviour.

So, the study of these structures made of this material raises the difficulty of creation of a numerical model, and it requires the use of sophisticated programs which simulate the behaviour. However, usually deformational parameters are estimated, as a result an small uncertainly is introduced.

In order to characterise masonry, a numerous number of authors have studied the tensodeformational behaviour, the resistant mechanism and the failure criteria under uniaxial and biaxial stress states.

Other way to analyse these structures is to carry out *in situ* tests to determine the vertical stress in masonry walls. Flat-jack test allows to know not only the vertical stress existing in masonry walls but also the vertical deformation modulus. Using dilatometric tests one can determine deformability properties of the internal masonry.

This study explains the procedure of a test with dilatometer in real masonry walls that will allows to know the deformability properties and the vertical stress existing in the wall as well. Previously, it is necessary to explain a test in the laboratory with masonry panels of dimensions 1x1.2 meters with a vertical load. In these panels one makes a hole which deforms the material around the hole. After, the dilatometer is inserted into the hole and the deformation of some measuring bands previously defined is recovered applying hydrostatic pressure to the dilatometer. The ratio between the pressure in the dilatometer and the initial vertical stress in the panel is the restitution coefficient. Furthermore, it is possible to deduce the ratio between elastic modulus of bricks and mortar from the deformation induced by pressure unit in the dilatometer.

In order to know the results that it could expect from the test with panels before doing them, the test in laboratory have been studied by means of a numerical model solved with a finite element method program. The values of restitution coefficients have been found out for a different positions of the hole into the panel, and we have studied the influence of lateral confinement in panels. Besides it has done a sensibility study that analyses the variation of the restitution coefficients with the values of the ratio between elastic modulus of bricks and mortar.

The use of temposonics extensometers and strain gauges is recommended to measure the deformations in the measure bands. But there are not experience in measuring deformations with strain gauges in masonry. So the present study has carried out some tests measuring deformations in bricks and it explains the preparation and application procedure of strain gauges over this kind of material. The measurement results obtained from the tests were good, but the result of one of the gauges was false, probably because the gauge was damaged during the application or because the wires were not well connected.

The tests in laboratory with panels and the tests in real masonry walls have been proposed from the results given by the numerical study with finite element method.