

SUMMARY

The current study is referred to the restoration of a building via bearing masonry. This building is in Thessaloniki at Leof. Stratou street.

The materials mechanical characteristics for the masonry, floors and roof were determined from another buildings' laboratory tests.

Firstly, was made a model (model 0) in SAP2000, which was consisted of shell and frame elements without floor diaphragm. A dynamic analysis was carried out in order to determine the dynamic characteristics of the building, in the initial situation, without any kind of strengthening. After that, it has been considered that the resistance of the masonry has been strengthened with some particular methods, and then was made a test of building's bearing capacity. For this test has been used the previous model, with the only difference that it has been taken the floor diaphragm (model 1). With the results of this analysis, the bearing elements were checked for both vertical as well as earthquake loads according to the E.C. 6. This checking gave many failures for the piers (~75%). It is obvious, that the building was in need of a intervention, in order to increase its resistance and decrease the failures.

The first intervention which has been studied is the reinforcement and armed mantling of all masonry (unilateral on perimetric and bilateral on the interior). For the analysis was used the previous model with same differences: the width of the piers was increased and the modulus of elasticity was changed (model 2). It followed the same tests as before and the results for the strength of the piers was much better. The percentage of failures was about 18%. These can be overcomes by increasing the percentage of the arming or the pier's width. However, this intervention has the basic disadvantage that it is irreversible, especially for a scheduled building.

Taking into consideration the above, it was necessary to be studied another intervention, with less damages on the masonry. So, it was studied the solution of putting rubber isolators below the base of the building. During this phase of my study, was checked both the isolators and the piers. The isolators was checked for shearing displacement for 3 earthquakes (Thessaloniki, Korinthos, Kalamata). If the presenting inefficiency for all isolators and all earthquakes was greater than 1, then it followed the checking of masonry in both flexion and shearing.

Finally, it had been studied relatively the results of these interventions in order to come into a conclusion for their advantages and disadvantages.