

ABSTRACT

This postgraduate dissertation deals with the study of seismic response of 3-storey concrete building. The building that is studied is the hotel "Ermionion". The hotel built in Kozani city. The study concerns so his initial form before the interventions in his bearer organism and his final form after his strengthening.

Initially the assessment of building takes place with the rapid optical control and is exported his final structural grades. Because his insufficiency, with the rapid optical control (OASP), becomes study of seismic response of existing building via the spectrum methods that are proposed by the Greek Aseismic Code (EAK2000). From these methods are calculated the building's response (stresses, displacements). The evaluation refers to the first storey columns. The control of sufficiency that follows refers for the first storey columns, and it concerns the control against biaxial bending moments with axial force and control of corner deformities (P- δ phenomena). The result from the controls is that columns need strengthening.

Then takes place the study of proposed form of strengthening, which concerns the manufacture of new concrete walls between columns, the manufacture of concrete cloaks in columns and beams and the strengthening of plates using fiber reinforced polymers (FRP). The strengthened building's study results big reduction in columns' stresses and displacements. The result is that building henceforth suffices against seismic forces.

In the last chapter of dissertation takes place a detail presentation of fiber reinforced polymers (FRP) that can be used for the strengthening of concrete elements, in existing buildings. Via experiments, that became in the Laboratory of Experimental Resistance of Materials and Manufactures, were studied various forms of fiber reinforced polymers' anchorages. The conclusions resulting from experiments is the fiber reinforced polymers' effectiveness, through their application in concrete elements' strengthening.

In the end, the comparison of response of existing and strengthened building takes place in level of oscillation, stresses and displacements. From the comparison results the effectiveness of strengthening methods that is presented, as well as certain observations in constructional subjects of fiber reinforced polymers' application in building's strengthening.

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