

LARGE-SCALE FEM ANALYSIS OF THE DYNAMIC BEHAVIOR OF REIN-FORCED CONCRETE BUILDINGS

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SUMMARY

In order to prevent urban disaster, it is very important to simulate the actual dynamic behavior of building structure suffering big earthquake. For this aim, usually, buildings are considered as simple model in which mass and springs are connected in series. However, these simple models are not enough to evaluate actual behavior buildings on earthquake. In this report, more accurate models are used for FEM analysis of RC buildings. The whole model is composed by upper framed structure, foundation, piles and surrounding soil.

Concrete is modeled by solid element, rebar is modeled by beam element. Soil and underground structures transit forces each other through the contact surface. By using Earth Simulator, numerical simulations are executed for this whole model.

Large amount of information are obtained from these simulations. We can check at once the data of a necessary part, whichever it may be the micro dynamic behavior of a small steel bar or it may be the macro behavior of whole structure.

This research will bring a new paradigm for structural designs when the computers whose ability is equal to that of current supercomputers is popularized widely.