DYNAMIC ANALYSIS OF BUILDINGS FOR EARTHQUAKE LOADING

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Earthquake is a natural hazard that naturally occurs randomly in the seismic areas all over the world. Even though Sri Lanka is not considered being in a region of high seismic activity, the recent tsunami disaster has brought into focus the need for preparing for what may be termed "extreme event". Those events have a very low probability of occurrence, yet catastrophic consequences if they occur.

Failure has resulted in a sudden change in the equilibrium stress state. The earthquake ground acceleration may induce inertia force in a structure sufficient to damage it. The size of earthquakes and frequency of occurrence depend on the state of stress in the earth's crust. Finally, people and there properties, the land and all the facilities in such areas are facing threats of earthquakes.

In the most general terms, damage can be defined as changes introduced into a system that adversely affects its performance. As for civil engineering structures, changes in materials, connections, boundary conditions, etc., which will cause deteriorated performance of the structure, can be considered as damage.

To develop earthquake-resistant buildings for moderate earthquakes by introducing releases to the structures is the purpose of this project. Therefore, this project contains preliminary studies, which require commencing the design stage of developing earthquake resisting building systems that can withstand under moderate earthquakes. The available methods such as shaking table, which are used to test building models practically under earthquake loading, are really expensive. Therefore structural analysis is done using a commercially available finite element code and simulating the earthquake conditions in that.

Modeling and analyzing of buildings under earthquake loading and finding earthquake forces and releases is the main objective of this study.

A multistory building in Sri Lanka is selected for this study. Our aim is to study the behavior of it under earthquake loading. Then to identify the places which are having critical stresses and displacements and then to introduce earthquake releases for such places.