Vulnerability of RC frame building with different ductilities under earthquake loading

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Abstract:

Retrofitting and strengthening of existing buildings is a new subject nowadays in Iran. Many buildings are not designed to resist earthquake loading and those which are designed, have some construction weaknesses. Change in the seismic loading code and the increasing proposed lateral load of earthquake is another problem which has created some problems for existing buildings. in order to rehabilitate buildings the planning&budget organization has published a specific guideline for retrofitting of buildings which has a different approach from than the seismic design code (2800-84-standard). This dissertation intends to compare the Iranian seismic code with this guideline

In this dissertation one fifteen story reinforce concrete building with intermediate and special moment frame system on soil type II and III is designed according to 2800 code, and then is evaluated according to the guideline provisions. The aim is to see whether it is safe or not?

The buildings have been designed according to linear static and linear dynamic and nonlinear static methods and all of the provisions of guideline are net.

The result of static Analysis show that the building has generally some weaknesses and need to be rehabilitated, specially in the linear static method. However in the linear dynamic method the results are more agreeable and building does not need to be rehabilitated as a whole, although there are some weaknesses in some members. Based on these result, it is concluded that the standard 2800 and ABA code are relatively in good agreement with guideline provision although some revision are needed.

The scaling of the shear in the dynamic analysis, which is required by the standard 2800, increases the lateral of force and makes building stronger. The reason that the dynamic analysis is in a better agreement with the guideline provision maybe due to this increase of bas shear.