

Seismic Retrofitting of Structures

Seismic retrofitting is the modification of existing structures to make them more resistant to seismic activity, ground motion, or soil failure due to earthquakes. With our recent experiences with large earthquakes near urban centres, the need of seismic retrofitting is well acknowledged. Prior to the introduction of modern seismic codes, many structures were designed without adequate detailing and reinforcement for seismic protection. Retrofitting of existing structures with insufficient seismic resistance accounts for a major portion of the total cost of hazard mitigation. Thus, it is of critical importance that the structures that need seismic retrofitting are identified correctly, and an optimal retrofitting is conducted in a cost effective fashion. Once the decision is made, seismic retrofitting can be performed through several methods with various objectives such as increasing the load, deformation, and/or energy dissipation capacity of the structure. There are both conventional and innovative methods for retrofitting. Conventional retrofitting methods include addition of new structural elements to the system and enlarging the existing members (Newman, 2001). Current research on advanced materials in civil engineering is mainly concentrated on high performance concrete and steel, and fibre reinforced plastic (FRP) composites. FRP composite materials have experienced a continuous increase of use in structural. The seismic base isolation technology involves placing flexible isolation systems between the foundation and the superstructure. It is also important to keep in mind that there is no such thing as an earthquake-proof structure, although seismic performance can be greatly enhanced through proper initial design or subsequent modifications.