

## Does India need another disaster to get serious about Earthquake Protection?

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India's growing economic might is making all nations look at it with a sense of envy. This new found economic prosperity has also left our country more vulnerable and susceptible to natural calamities. It is imperative that we start following the global best practices and stop living in a sense of denial. Two nations have learnt their lessons the hard way, US and Japan. The colossal damage caused by the quakes of Northridge in 1994 and Kobe in 1995 forced the Governments to spend millions on research. The research helped in better understanding of how structures perform in these devastating scenarios and this led to classification of buildings as per their performance. Now there exist internationally accepted documents issued by the two Governments.

With the real estate boom having taken India by storm it is imperative that all understand the basics of seismic protection. Most neglect the subject as one that is a bit too technical for their liking; however the paragraphs below would prove this theory to be a fallacy. Two questions that would occur to an average educated person are, what are the different categories of quake protection and what protection level is he achieving by following the Indian Seismic Code.

In today's world simply stating that a building is earthquake resistant is meaningless. It does not portray anything about the building performance during an earthquake, its post quake use and the magnitude and kind of damage that it will sustain. It will come as a surprise to most that earthquake resistant till date does not have a definition in our country. Neither the national disaster management guidelines nor the Indian seismic code have even attempted to address the issue. This has led the term being misused and misquoted by one and all.

Internationally earthquake protection is classified into four categories; each having a detailed definition. The categories are operational, immediate occupancy, life-safety and collapse prevention (see figure).

Operation is the highest level and is adopted for important structures like hospitals, administrative centers and essential infrastructure. Operational buildings are seldom more than 5 or 6 storey high.

The second level is 'immediate occupancy' and buildings designed to these standards sustain minimal structural damage even during a major earthquake. They are safe for occupation and use immediately after a major earthquake.

Life-safety buildings are those that are such designed that the primary aim is to save lives; the building per se will sustain severe structural damage. After the earthquake the kind and level of damage that the columns suffer will determine if the building is repairable or will have to be demolished and rebuilt.

The lowest category 'collapse prevention' buildings are those that will sustain extensive structural

damage. The damage will render the building unfit for use and will have to be immediately vacated, demolished and subsequently rebuilt.

Presently incase the builder / developer has followed the Indian seismic building code to the fullest, the building would achieve collapse prevention level of safety. The term 'collapse prevention' is disguised in our country by using alternate words i.e. earthquake resistant.

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