

Main factors of
seismic vulnerability
of buildings and how
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the ...



Main Factors Influencing the Seismic Vulnerability of Buildings 1. Load Path

The usual load path for seismic forces is from horizontal diaphragms to vertical walls and frames to the foundation from where these forces are transmitted to the supporting soil. If this load path is discontinuous and is not based on a lateral force resisting system, then the building will not be able to resist seismic forces.

2. Adjacent Buildings and Poundings Buildings that are built too close and the interaction gap is less, then during an earthquake, they will create extra inertial load on each other's structure especially when the floors of the two buildings are at the different elevations exhibiting different dynamic behaviors.
3. Large Settlements in Seismic Areas There is a large population that lives in seismic vulnerable areas and the buildings there are more prone to earthquakes because of aging and lack of maintenance.
4. Non-Engineered Constructions Non-engineered construction is very much prone to seismic vulnerability as the buildings will not have good engineering techniques that would save them from seismic waves.

2. Seismic Vulnerability Assessment can be used for assessing the seismic impacts in an urban area. Urban area consists mainly of those buildings that are vulnerable to earthquakes and hence are damaged or poorly maintained. For example, a lot of urban area damaged " occurred in vulnerable houses in every earthquake experienced by Italy in the post-war period, and particularly during the Friuli and the Irpinia earthquakes" (Cozzi, Menoni, Pergalani & Petrini 2003: 4). The vulnerability assessment of seismic activity in urban areas and the application of proper solutions to counter these damaging activities can be helpful in reducing the casualties and destruction (Agrawal & Chourasia 2008) and economic loss caused by future

earthquakes, according to Vicente et al. (2010). They further state that in urban areas, vulnerability assessment of seismic waves should be studied with the main purpose that the building's fragilities and their risk of suffering from seismic risk may be reduced. Many researchers have affirmed that the urban areas are at a risk of serious seismic damage because of structures and materials that are used in urban construction which makes it important to study, assess and evaluate the urban construction in order to reduce seismic vulnerability. This study is vital to predict the casualties and lessening of destruction. This assessment is also useful for the rehabilitation and reconstruction of the area. The whole process requires time, effort and a detailed study of the urban areas' inventory of structures. " If we can identify the urban structures on the basis of their areas from the polarization characteristics, the results can be used in the seismic vulnerability assessment" (Aoki et al. 2011). According to Yakut et al. (2007), In urban areas, where there is a large stock of existing buildings, most of which have inferior seismic capacities, determining the vulnerable buildings within the existing building stock is a high priority task for taking the necessary remedial measures for disaster mitigation prior to potential seismic events. Hence, it can be concluded that assessment of seismic vulnerability can be used to assess seismic impact in urban areas with the aim of reducing seismic risk in the buildings. For this purpose, simple and reliable seismic assessment tools have been developed that enable the implementation of mitigation strategies to lessen the impact of seismic activities in urban areas. References Agrawal, SK & Chourasia, A 2008, Methodology for Seismic Vulnerability Assessment of Building Stock in Mega Cities, viewed 5 February

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