

Technical Note on Earthquake Safety of Tall Buildings in High Seismic Zones

Construction of iconic and tall buildings in high seismic zones, keeping them safe from the severest of the earthquakes is a highly technical work. Conventional design strategy and construction methods do not work. Specialist technologies and 'performance based design' are used for design and construction of such structures.

Taylor Devices are the world leaders in earthquake protection technologies for such like buildings. The press release and photographs of a recently completed 70 Storey building in the world's most active seismic zone is appended alongside i.e. 181 Fremont <https://www.181fremont.com/>

The building employs 'performance based design' and the world's best aerospace quality and NASA certified dampers to protect it from earthquakes and high winds. All dampers carry 35 years warranty and are manufactured by Taylor Devices. 181 Fremont is designed to 'Immediate Occupancy' seismic standard as per international codes, presently the Indian Code for 'performance based design' does not exist. 'Immediate Occupancy' seismic performance implies that even if there is a major earthquake there will be Zero structural damage and the building will be safe for occupation and use immediately after the major earthquake.

Many buildings are aimed to become landmark for times immemorial and Taylor Devices has always recognized this and contributed in designing engineering marvels and at the same time saving costs. Taylor Devices is a specialist company since 1955 in the field of energy dissipation having over 95 patents and over 675 projects to its credit. It is a pioneer in advanced seismic and wind protection technology. The Indian operations of Taylor Devices are based at Gurgaon and Taylor Devices India is offering turnkey services as a damper contractor.

Taylor Devices has established many a benchmarks in providing more than the mandatory safeguards and safety to its clients as well as adding marketable USP to projects. Generally all buildings will just have just one-line-of-defense i.e. the reinforced concrete/steel structure comprising of shear walls, columns and beams, these structural members resist any damage that is tried to be imposed on the building by an earthquake or any other natural or manmade calamity. However unlike any other counterpart buildings incorporating Taylor Devices has two-lines-of-defense. The first line-of-defense being the seismic dampers that act like giant shock absorbers and which absorb most of the earthquake energy leaving just a fraction of the seismic energy to be absorbed by the shear walls, columns and beams. This is critical in ensuring that the building stays unharmed. In the presence of seismic dampers the building structure acts as the second line-of-defense. Energy dissipation by seismic dampers ensures total building safety and is also the key as to why modern high-rise buildings performed so well during the great earthquake in Japan where energy dissipation is part of the regular code guidelines.

The seismic dampers can be carefully hidden in the building skeleton or on some occasions a few are left visible from marketability point of view. The dampers function only on a need basis during severe wind storms or an earthquake. These dampers are built with aerospace technology and even to date such dampers are used for energy dissipation in all NASA aerospace mission launches. The technology is patented by Taylor Devices. The dampers are most robust in construction, are maintenance free and come with a 35 years warranty.