Design and Construction of Seismic Isolation Buildings

Seismic isolation, Response control, Earthquake structure



Hazard

Earthquake

Solution Purpose

Prevention & Mitigation Recovery

Solution Theme

Disaster Prevention Plan Infrastructure Technology Building Technology Rescue & Medical Treatment Products & Goods

Technology Subject

Business Continuity Plan Road Railways Airport Essential Utilities Urban Facility for Disaster Prevention Emergency Base & Back-up Facility Design & Construction of Resilient Building Resilience Improvement on Existing Building Emergency Medical Service Machinery & Equipment

Advantages

Fujita Corp. has constructed over 120 seismically isolated buildings and 60 energy dissipated buildings. Fujita Corp. also developed anti-seismic devices such as lead rubber bearing, viscous damper and buckling restrained brace, etc. cooperating with device manufacturers. Fujita Corp. is a general contractor, where design teams, construction teams and research teams work together to develop and use the new technology to make buildings more stronger against earthquake.

Solution Illustrated

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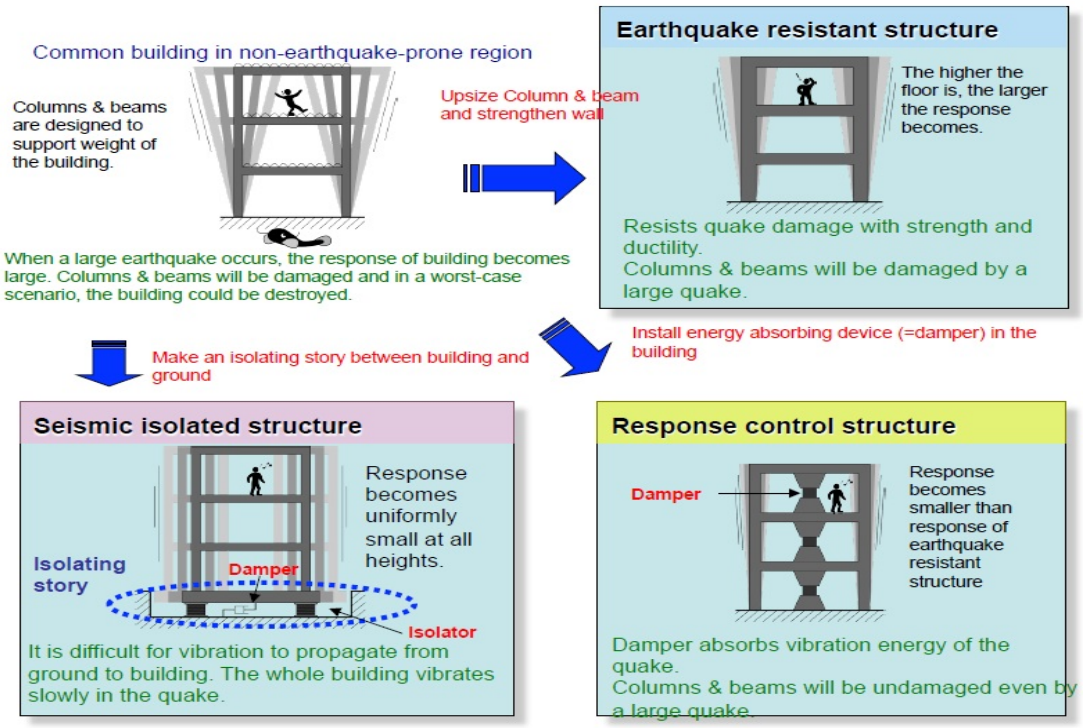

Background

Seismic isolation and energy dissipation technologies have been proved to be the most effective way to reduce earthquake disaster in recent large earthquakes, from the 1995 Hyogoken-Nanbu earthquake to the 2011 Tohoku earthquake. These technologies apply not only to new buildings but also to existing buildings. Seismic isolation technology extremely reduces the response of the super-structure, such as protect both building itself and also contents such as furniture and ceiling, etc. Seismic isolation technology extended its usage from public facilities, hospital and apartment to school and even warehouse.

Exposition of the Solution

Seismic isolation technology keeps the function of the building, which can be used continuously after the earthquake. Life cycle cost of the building will be cheaper than the conventional anti-seismic one. Seismic isolation technology reduces the response, such as precast technology etc. will be used more easily.

A hospital can continue operating even in the earthquake, which can keep its emergency base function. A company can maintain business continuity plan (BCP) after the earthquake. Supply chain will not be interrupted during the earthquake. Goods in a warehouse will not flow out in the small or large earthquake.

Achievements of Examples

Fujita Corp. has used seismic isolation technology to apartments (SHINJYUKU Ains Tower, KORIEN Tower), hospitals (Kumamoto Univ. hospital, Osaka GYOMEIKAN hospital), city hall (SHIMA City Hall, Higashi Hiroshima City Hall), offices (MF Minamimorimachi Building, Toyoda Iron Works head office) and warehouse (Prologis Park Yokohama, KEIHIN Truck Terminal). The seismic isolation floor is not limited at base but also used in the middle story. Fujita Corp. has used energy

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dissipation technology to offices (OMIYA Sonic City, Kakyoin Square), apartments (MIDORII Sky Stage) and schools (TOHOKU UNIV. Campus, Hiroshima Institute of Technology Nexus21).

Seismic isolation technology





Osaka GYOMEIKAN hospital JA Wakayama

Energy dissipation technologies

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