Design of Seismic Isolated Buildings

Seismic isolation enables recovery of the building's functions as well as structural safety



Hazard

Earthquake

Solution Purpose

Prevention & Mitigation

Solution Theme

Building Technology

Technology Subject

Facility for Disaster Prevention Design & Construction of Resilient Building Resilience Improvement on Existing Building

Advantages

Having designed more than 300 seismically isolated buildings, Nikken Sekkei can offer the best seismic isolation solutions. Nikken Sekkei is a comprehensive design firm with structural engineers, architects, and MEP engineers with extensive experience in seismic isolation technologies. Nikken Sekkei's seismic-isolation building designs provide earthquake resistance and easy recovery. Nikken Sekkei recommends seismic isolation for government facilities and emergency recovery centers that lead disaster emergency and recovery efforts after an earthquake, hospitals that have non-transferable patients, factories that require high levels of safety, and offices and data centers that require business continuity.

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Solution Illustrated



In the blackout after the shake of the 2011 great earthquake, EPS suprted medical activities.

Background

Seismic isolation has been applied to buildings for a long time. In Japan, the application of seismic isolation technologies to buildings increased drastically after the Hanshin Awaji Great Earthquake in 1995 and the Great East Japan Earthquake in 2011. As of 2012, more than 3,300 buildings and more than 4,600 houses have been seismically isolated. Japan leads the world in seismic isolation. Japan's seismic isolation engineering has been proven in two great earthquakes. Seismically isolated buildings in the devastated areas suffered no damage in the 2011 great earthquake.
Japanese engineers design seismically isolated buildings using combinations of devices, such as rubber bearings, sliding bearings, roller bearings, hysteresis dampers, and oil damper.
These outcomes were made possible by collaborations of industry, academia, and government in the research and development of codes and standards, design methods, and devices for seismic isolation technologies, as well as by several percentage points of additional investment in building structures by the owners of buildings and houses.

Exposition of the Solution

Seismic isolation enhances a building's safety in a severe earthquake and significantly mitigates the acceleration of the items inside the building. This speed the recovery of the building's functions after a severe earthquake. Seismic Isolation prevents the loss of function, especially in facilities that are vital for emergency and recovery efforts. This safety forms the basis of a building's business continuity plan (BCP) and district continuity plan (DCP). Seismic isolation also contributes to a hospital's medical

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continuity plan (MCP) after an earthquake, when hospitals must be able to handle dramatic increases in the number of patients.

Achievements of Examples

Nikken Sekkei group has designed more than 300 seismic isolated buildings, including offices, condominiums, data centers, governmental facilities, emergency recovery centers, and major hospitals. Since the East Japan Great Earthquake in 2011, Nikken Sekkei usually proposes seismic isolation for major hospitals.

Corporate Profile

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