

RUBBER SEISMIC ISOLATION TECHNOLOGY (RSIT)



Rubber seismic isolation technology has become the preferred structural design technique for buildings and bridges in highly seismic areas, that is, areas most susceptible to earthquakes.

The technology was developed by the Rubber Research Institute of Malaysia (RRIM) and the Earthquake Engineering Research Centre at the University of California in Berkeley in the 1980s.

According to the United States Geological Survey (USGS), an average of 18 major earthquakes (magnitude of 7.0 to 7.9 on the Richter scale) and one great earthquake (magnitude 8.0 and greater) occurs every year.

Providing a base isolation device like the RSIT between the building and the ground can minimize the level of earthquake force transmitted to the buildings by between one-half to one-third.

This system protects the building finish, furniture, utensils, electronic apparatus, building frames, etc, from the shock of an earthquake.

With RSIT, the building is separated from the foundations. Steel or reinforced concrete beams replace the connections to the foundations, while under these, layered rubber bearings replace the material removed.

This base isolation allows the ground to move while the building, restrained by its inertial mass, remains relatively static.

The first base isolated building in the United States was the Foothill Communities Law and Justice Center in San Bernadino County, 20 km from the San Andreas faultline in California. This building was completed in 1985 with the RSIT rubber bearings developed by RRIM.

The University of Southern California Hospital, 36 km from the epicenter of the 1994 California earthquake, was also constructed with RSIT rubber bearings, and sustained no damage, compared to other buildings nearby.

Base-isolated buildings and structures installed with rubber bearings also sustained little damage in the 1995 Kobe earthquake. None of the bridges using rubber bearings collapsed, while all of the bridges which came crashing down were installed with steel bearings.

Following the Kobe earthquake, all new bridges constructed in Japan now use rubber bearings for their base isolation systems.

More than 7,000 buildings worldwide have already been installed with base isolation systems.

The Malaysian Rubber Board (MRB) has been involved in an increasing number of projects worldwide to install RSIT base isolation systems, especially in highly earthquake prone countries.

In China, three 84m diameter LNG tanks in Guangdong were installed with RSIT rubber bearings in 2005.

The MRB is also involved in the world's largest base isolation project in the Middle East.