Using Seismic Base Isolation Systems in High-Rise Hospital Buildings and a Hybrid Proposal

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Abstract : The fact of earthquakes in Turkiye is an inevitable natural disaster. Therefore, buildings must be prepared for this natural hazard. Especially in hospital buildings, earthquake resistance is an essential point because hospitals are one of the first places where people come after an earthquake. Although hospital buildings are more suitable for horizontal architecture, it is necessary to construct and expand multi-storey hospital buildings due to difficulties in finding suitable places as a result of excessive urbanization, difficulties in obtaining appropriate size land and decrease in suitable places and increase in land values. In Turkiye, using seismic isolators in public hospitals, which are placed in first-degree earthquake zone and have more than 100 beds, is made obligatory by general instruction. As a result of this decision, it may sometimes be necessary to construct seismic isolated multi-storey hospital buildings in cities where those problems are experienced. Although widespread use of seismic isolators in Japan, there are few multi-storey buildings in which seismic isolators are used in Turkiye. As it is known, base isolation systems are the most effective methods of earthquake resistance, as number of floors increases, center of gravity moves away from base in multi-storey buildings, increasing the overturning effect and limiting the use of these systems. In this context, it is aimed to investigate structural systems of multi-storey buildings which built using seismic isolation methods in the World. In addition to this, a working principle is suggested for disseminating seismic isolators in multi-storey hospital buildings. The results to be obtained from the study will guide architects who design multi-storey hospital buildings in their architectural designs and engineers in terms of structural system design.

Keywords : earthquake, energy absorbing systems, hospital, seismic isolation systems