BASE ISOLATION OF HOSPITALS AND OTHER CRITICALLY IMPORTANT STRUCTURES

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There has been much emphasis on the suitability of base isolation for critically important structures such as hospitals, emergency centres for Civil Protection or schools. For such buildings where protection of contents is critical, either because of their value or because of the need to maintain serviceability after an earthquake, seismic isolation has been proven to be an attractive option both technically and economically (Dusi et al., 2007), (Castellano et al., 2007).

This paper presents some recent example of base isolated hospitals and Civil Protection emergency centre in Europe and in Turkey (see for example Figure 1) by focussing on structural design issues and qualification and acceptance experimental tests on the isolators.

It is well known that seismic isolation allows to preserve the functionality of buildings even immediately after a strong earthquake. However, in addition to the abovementioned benefit, and as far as the mere structural aspects are concerned, significant cost savings can be achieved in base isolated buildings thanks to a structural configuration that fully exploit the advantages offered by seismic isolation leading to either a new layout of the superstructure resisting elements with less ductile detailing and to a simpler and more economic foundation scheme with respect to the original fixed-based structure. This can easily be achieved provided that, starting from the conceptual design phase, the structural engineer experienced in base isolation works jointly with the team drafting the initial building layout. The importance of the definition of conceptually new structural configuration and morphology in the design of the base isolated solution is also presented and discussed; emphasis is placed on the structural configuration modifications that has been adopted, from the conventionally designed option, in the base isolated design in order to maximize the effectiveness of the base isolated solution from either the seismic performance enhancements and the economic points of view.

Figure 1. A double concave curved surface slider during installation in the Van Medical Campus (Turkey)

REFERENCES

Castellano MG, Cosenza E, Di Sarno L, Guerreiro L, Lupoi G and Infanti S (2007) Seismic isolation of hospitals: the examples of Udine, Lisbon and Naples hospitals, *Proceedings of the 10th World Conference on Seismic Isolation, Energy Dissipation and Active Vibration Control of Structures*, Istanbul, Turkey

Dusi A and Mezzi M (2007) Increasing Safety of Structures in Seismic Areas: the Base Isolation Challenge, *Proc. 5th International Conference on Seismology and Earthquake Engineering*, Tehran, Iran