

Assessment of the Energy Balance Method in the Case of Masonry Domes

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Abstract : Masonry dome structures had been widely used for covering large spans in the past. The seismic assessment of these historical structures is very complicated due to the nonlinear behavior of the material, their rigidness, and special stability configuration. The assessment method based on energy balance concept, as well as the standard pushover analysis, is used to evaluate the effectiveness of these methods in the case of masonry dome structures. The Soltanieh dome building is used as an example to which two methods are applied. The performance points are given from superimposing the capacity, and demand curves in Acceleration Displacement Response Spectra (ADRS) and energy coordination are compared with the nonlinear time history analysis as the exact result. The results show a good agreement between the dynamic analysis and the energy balance method, but standard pushover method does not provide an acceptable estimation.

Keywords : energy balance method, pushover analysis, time history analysis, masonry dome

Conference Title : ICEDT 2017 : International Conference on Earthquake and Dynamic Tectonics

Conference Location : Paris, France

Conference Dates : June 25-26, 2017