

Nonlinear Analysis of a Building Surmounted by a RC Water Tank under Hydrodynamic Load

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Abstract : In this paper, we study a complex structure which is an apartment building surmounted by a reinforced concrete water tank. The tank located on the top floor of the building is a container with capacity of 1000 m³. The building is complex in its design, its calculation and by its behavior under earthquake effect. This structure located in Algiers and aged of 53 years has been subjected to several earthquakes, but the earthquake of May 21st, 2003 with a magnitude of 6.7 on the Richter scale that struck Boumerdes region at 40 Kms East of Algiers was fatal for it. It was downgraded after an investigation study because the central core sustained serious damage. In this paper, to estimate the degree of its damages, the seismic performance of the structure will be evaluated taking into account the hydrodynamic effect, using a static equivalent nonlinear analysis called pushover.

Keywords : performance analysis, building, reinforced concrete tank, seismic analysis, nonlinear analysis, hydrodynamic, pushover

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