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Site Specific Ground Response Estimations for the Vulnerability Assessment of the Buildings of the Third Biggest Mosque in the World, Algeria's Mosque

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Abstract : Equivalent linear and non-linear ground response analyses are conducted at many representative sites at the mosque of Algeria, to compare the free field acceleration spectra with local code of practice. Spectral Analysis of Surface Waves (SASW) technique was adopted to measure the in-situ shear wave velocity profile at the representative sites. The seismic movement imposed on the rock is the NS component of Keddara station recorded during the earthquake in Boumerdes 21 May 2003. The site-specific elastic design spectra for each site are determined to further obtain site specific non-linear acceleration spectra. As a case study, the results of site-specific evaluations are presented for two building sites (site of minaret and site of the prayer hall) to demonstrate the influence of local geological conditions on ground response at Algerian sites. A comparison of computed response with the standard code of practice being used currently in Algeria for the seismic zone of Algiers indicated that the design spectra is not able to capture site amplification due to local geological conditions.

Keywords : equivalent linear, non-linear, ground response analysis, design response spectrum
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