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Site amplification factor at Mardan, Pakistan

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This paper presents site response analyses for a site at Mardan Campus of NWFP University of Engineering and Technology Peshawar. This study is a part of extensive instrumentation to be installed at Mardan campus under Pak-US Earthquake Collaborative Research Program funded jointly by Higher Education Commission (HEC) and USAID, which includes installation of two subsurface and a surface accelerometers in three boreholes connected to a common data acquisition system. The three boreholes with depth offifty (50) meters, hundred (100) meters, and fifty (50) meters are drilled at three (3) meters spacing. Geotechnical tests are conducted on the samples retrieved from these boreholes. Among other geotechnical tests, Standard penetration test, cone penetrations test, and Cross-hole test are also conducted in borehole to characterize the soil at the site. Shear wave velocities at 1m spacing are determined using cross-hole tests up to 50m depth. The site of interest has co-ordinates 34.01^{o} N, 72.00^{o} E. Seismic hazard analysis for the site is performed with deterministic approach using sixteen (16) faults within one hundred (100) km around the site. Peak ground acceleration for rocks is computed with shear wave velocity value 760 m/s. Boore and Atkinson Next generation attenuation (NGA) model is used to compute the peak ground acceleration values. Based on the controlling earthquake and the maximum peak ground acceleration value three real time histories are selected from the data bank of pacific earthquake engineering center (PEER). Equivalent linear site response analysis is conducted using DeepSoil software. Amplification spectrum is developed for the site and site response factors are compared with those from different International Codes.