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Seismic Hazard Analysis and Ground Motions for Peshawar Metropolitan City, Pakistan

The seismic hazard at a site can be well quantified in term of fault rupture mechanism and site effect on seismic stress waves propagation. The input ground motion is an important parameter for the seismic characterization of ground response analysis and engineering structures. The presence of several active reverse faults in the vicinity of Peshawar Metropolitan city makes it vulnerable to permanent seismic hazard. The worldwide earthquake records compatible with the local seismic hazard of Peshawar is a good alternative as Pakistan lacks regional arrays of seismographs. Based on the seismic hazard parameters of reverse faulting this study evaluated seven representative input motions from PEER strong motion database that can be used in ground response analysis. The resulted ground motion shows that the seismic hazard at Peshawar is capable to produce earthquake of magnitude 7.0 and above. Furthermore, the resulted peak acceleration at bedrock is in the range of 0.16g to 0.24g as specified for seismic Zone-2B. The resulted response spectrum of ground motions is strong between time period 0.15 to 0.20 sec.
Keywords: Seismic hazard; Peshawar; Ground response spectrum

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