Estimation of Site Response in Gujarat Region

Sumer Chopra*#, Dinesh Kumar+ and B K Rastogi*

*Institute of Seismological Research, Gandhinagar 382009 ⁺Department of Geophysics, Kurukshetra University, Kurukshetra 132119 [#]sumer.chopra@gmail.com</sup> (corresponding author)

The waveforms of local earthquakes with magnitudes 2.5-4.3 recorded at 36 sites in Gujarat region have been used to estimate site response by Horizontal to Vertical Spectral Ratio (HVSR) method. The recording sites are located in different regions with varying geology of Gujarat. These include 18 sites in Kachchh region, where the seismic network is dense due to intense seismic activity, 8 are in Saurashtra and 10 in mainland Gujarat region. Out of 36 stations 7 stations are located on Quaternary deposits, 6 on Tertiary, 11 on Deccan, 4 on Jurassic, 5 on Cretaceous and 3 on Proterozoic rocks. The average values of the site amplification at predominant frequencies vary from 3.6 ± 0.08 for the sites at Cretaceous rocks to 4.3 ± 1.2 for the sites of Quaternary deposits. The corresponding values for the sites of Deccan trap have been estimated to be 4.1 ± 1.1 . The Jurassic sites give higher average value of 5.6 ± 1.3 . The estimated site amplifications have been correlated with the damage at few sites during 2001 Bhuj earthquake. The spatial distribution of predominant frequencies of different heights of buildings presented here are useful the evaluation of seismic hazard in the region.