

Ground response of Kathmandu Valley Sediments during 2015 Gorkha Earthquake

The Kathmandu Valley was strongly rocked at 11:56 local time by an Mw 7.8 earthquake on 25th of April 2015. This earthquake was followed by a large number of aftershocks including the 12th May 2015 (Mw 7.3) Dolakha Earthquake. Largest peak ground acceleration (PGA) was observed at a rock site during the M 7.8 earthquake, however velocity was smaller. On the other hand, the soil sites have recorded smaller acceleration but the velocity was comparatively large during the M 7.8 earthquake. The large velocity at the soil sites is the reason for strong shaking of the multi storey apartment buildings and the damage they sustained and comparatively smaller accelerations are responsible for the small damage of engineered low rise buildings. During other (M>6.0) earthquakes the PGA at rock site are smaller and are large at soil sites. Fourier amplitude spectrum of the acceleration data reveals the predominant frequency at soil sites ranges between 0.2 to 0.3 Hz for the Mw 7.8 earthquake. However, during its strong aftershocks the predominant frequency moves towards high frequency. Fourier amplitude spectrum reveals that, on horizontals, the high frequencies are damped rapidly above 1 Hz.

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