

Estimation of shallow shear wave velocity in Bandung basin, Indonesia using horizontal to vertical (H/V) spectral ratio

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Bandung, the third populous city in Indonesia with population of around 2.7 million, is located in the western part of Java island. The city lies on a basin structure called Bandung basin. The concern of seismic risk in this area becomes important as existing of 24 km-long Lembang fault in the northern part. As part of potential seismic hazard estimation, Microtremors measurement is one of effective tool to estimate shear wave velocity profile and site amplification factor, especially in the urban area. A 3 component microtremors measurement is conducted in 76 sites to observe horizontal-to-vertical (H/V) spectral ratio that reflected to the ground characteristic. In the previous work, the obtained shear wave velocity models from Spatial Autocorrelation (SPAC) are used as reference model. Estimation of the ground structures are using the tuning factor to fitting the observed H/V spectrum with the theoretical ellipticity of fundamental mode of Rayleigh wave from the velocity model. From the obtained velocity model, we observed the thicknesses of soft layer (<500 m/s) from north to south of basin are changing from around 8 to 12 m in edge of basin area and around 40 m at the central of basin. The obtain profiles provide detail structure information in Bandung basin. Also the calculation of AVS30s and site amplification factor were conducted in each site, to understand the potential seismic hazard in the area. We also discuss a spatial variation of the amplification of earthquake ground motion using the obtained profiles.

Keywords: H/V spectral ratio, S-wave velocity, shallow soil, Bandung basin, amplification