

Estimasi Tingkat Kerentanan Seismik di Kecamatan Tandes dan Sambikerep, Surabaya Barat Menggunakan Metode Horizontal to Vertical Spectral Ratio (HVSr) Data Mikrotremor = Estimation of Seismic Vulnerability Level in Tandes and Sambikerep District of West Surabaya using the Horizontal to Vertical Spectral Ratio (HVSr) Method for Microtremor Data

Qonita Shobrina, author

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Abstrak

Kota Surabaya bagian barat berada di antara dua patahan aktif, yaitu Patahan Surabaya dan Waru. Mikrozonasi seismik dan karakterisasi lokasi gempa di wilayah sekitar patahan sangat penting untuk pembangunan kota dan mitigasi potensi bencana akibat gempa. Tujuan penelitian ini adalah mengestimasi tingkat kerentanan seismik di Kecamatan Tandes dan Sambikerep yang berada di bagian barat Kota Surabaya. Data mikrotremor diolah menggunakan metode Horizontal to Vertical Spectral Ratio (HVSr) untuk mendapatkan nilai frekuensi dasar (f_0) nilai amplifikasi (A_0), dan kurva H/V. Inversi kurva H/V dilakukan untuk mendapatkan profil nilai kecepatan gelombang geser (V_s) terhadap kedalaman. Indeks kerentanan seismik tanah (K_g) dihitung berdasarkan nilai amplifikasi permukaan (A_0) dan frekuensi dasar (f_0). Hasil penelitian menunjukkan nilai frekuensi dasar (f_0) di Kecamatan Tandes dan Sambikerep berkisar antara 0,5051-3,9541 Hz. Sebaran nilai faktor amplifikasi (A_0) di Kecamatan Tandes dan Sambikerep berkisar antara 1,0250-4,1135. Indeks Kerentanan Seismik (K_g) di wilayah penelitian bervariasi antara 0.4602 hingga 15.3294. Kecamatan Tandes dan Sambikerep memiliki nilai Kerentanan Seismik (K_g) relatif rendah sehingga lebih aman untuk pembangunan infrastruktur daripada daerah bagian utaranya.

.....The western part of Surabaya city is located between Surabaya and Waru active faults. Seismic microzonation and characterization of earthquake locations around fault areas are very important for city development and potential disaster mitigation caused by earthquakes. The objective of the research is to estimate the level of seismic vulnerability in the Tandes and Sambikerep districts located in the western area of Surabaya City. The microtremor data was processed using the Horizontal to Vertical Spectral Ratio (HVSr) method to obtain fundamental frequency values (f_0), amplification values (A_0), and H/V curves. Inversion of H/V curves carried to obtain profiles of shear wave velocity values (V_s) versus depth. The soil seismic vulnerability index (K_g) is calculated based on the surface amplification value (A_0) and fundamental frequency (f_0). The research results show that the fundamental frequency (f_0) value in Tandes and Sambikerep Districts ranges between 0.5051-3.9541 Hz. The amplification factor values (A_0) in Tandes and Sambikerep Districts range between 1.0250-4.1135. The Seismic Vulnerability Index (K_g) of the study area varies from 0.4602 to 15.3294. Conclusion. Tandes and Sambikerep districts have relatively low Seismic Susceptibility (K_g) values. Therefore, these areas are safer for infrastructure building than the northern areas.