

ABSTRACT

This study aims to identify the subsurface layer structure along Burangrang Utara IV Road, Tembalang District, Semarang City, based on shear wave velocity (V_S) and V_P/V_S ratio using the microtremor method with the Spatial Autocorrelation (SPAC) approach. The SPAC method works by utilizing statistical correlations between measurement station from microtremor recording to extract dispersion curves that represent the subsurface layer conditions with depth. The dispersion curve are then subjected to an inversion process to obtain the wave velocity profile with depth. The results of the study show that V_S value in the study show area range from 503 – 1173 m/s, while the V_P/V_S value range from 1,63 – 5,44. The distributions of these values indicates variations in subsurface conditions both vertically and laterally. On the C3 profile, a zone with low V_S of 503 m/s and high V_P/V_S of 5,44 was identified at a depth of 50 meters, indicating soft and water saturated material that potentially acts as a weak zone contributing to road damage. Meanwhile, transects D indicate more compact and stable subsurface conditions. Overall, the subsurface structure consists of a relatively soft shallow layer and a dense deeper layer. The results of this study can be used as a basic for mitigation efforts and more sustainable road improvements planning.

Keywords : microtremor, SPAC, V_S , V_P/V_S , subsurface structure.