

ABSTRACT

Road deformation in the Jangli area of Semarang City is a serious issue that impacts safety and increases infrastructure maintenance costs. This study aims to analyze subsurface soil characteristics as contributing factors to deformation using the Horizontal to Vertical Spectral Ratio (HVSr) method. The parameters examined include shear wave velocity V_s , the V_p/V_s ratio, soil amplification A_0 , seismic vulnerability index K_g and Ground Shear Strain (GSS). Results show that V_s ranges from 175,11 to 3027,93 m/s, with the highest V_p/V_s value of 11,85 found in soft and saturated soil layers. Soil amplification values range from 1,0008 to 6,61 and K_g reaches a maximum of 22,76, indicating areas of high seismic vulnerability. The highest GSS value of 5.6×10^{-3} indicates a strong potential for ground deformation. These findings demonstrate that subsurface geotechnical characteristics play a significant role in road damage, and that the HVSr method is effective for planning and mitigating road infrastructure in vulnerable areas.

Keywords: road deformation, HVSr, soil amplification, seismic vulnerability, GSS, Jangli Semarang.