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2D SEISMIC REFRACTION TOMOGRAPHY SURVEY ON METASEDIMENT AT A PROPOSED DEVELOPMENT SITE IN DENGKIL, SELANGOR

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ABSTRACT: A geophysical survey using seismic refraction technique was carried out at a proposed development site at MINT-Dengkil. The aim of the study was to characterize the subsurface materials based on seismic P-S wave velocities as well as to correlate those data with the lithologic logs and the standard penetration test (SPT) N-values. The study area is about 40 km squares, consisting of shale, slate and siltstones of the Kenny Hill Formation. Seismic surveys were carried out using ABEM MK 3 as a recording seismograph, and 24 units of 14Hz-frequency geophones 'to record the incoming seismic waves. The data were processed using an OPTIM software to produce sections of 2D velocity model profiles. Results show P-wave velocity of clayey silt (SPT=3-11) is ranging from 300-500m/s and S-wave velocity is ranging from 80-100m/s. P-wave velocity value for sandy silt (N=12-16) is ranging from 500-800m/s and S-wave velocity is found ranging from 100-300m/s. P-wave velocity value representing hard silt with gravel (N=20-50) is ranging from 900-1600m/s and S-wave velocity is ranging from 300-450m/s. The S-wave velocity obtained from seismic surveys show only slight difference in values compared with those calculated using SPT N values. The calculated Poisson ratio value ranging from 0.43-0.47, representing clayey-silt and sandy-silt. Velocity model sections were correlated well with the lithologic and SPT N values at each borehole. In the study area, the SPT test was terminated when the N value reached 50 which correspond to the hard gravelly silt soil. The SPT test was only conducted in soft soil zone without penetrating the bedrock, whereas for the seismic survey, some of the 2D velocity model cross sections show P-wave velocity values range from 3500 to 4000m/s at a depth of more than 15m. This high velocity values can be interpreted as representing slightly weathered to fresh rock.