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Use of Statistical Correlations for the Estimation of Shear Wave Velocity from Standard Penetration Test-N-Values: Case Study of Algiers Area

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Abstract : Along with shear wave, many soil parameters are associated with the standard penetration test (SPT) as a dynamic in situ experiment. Both SPT-N data and geophysical data do not often exist in the same area. Statistical analysis of correlation between these parameters is an alternate method to estimate V_s conveniently and without additional investigations or data acquisition. Shear wave velocity is a basic engineering tool required to define dynamic properties of soils. In many instances, engineers opt for empirical correlations between shear wave velocity (V_s) and reliable static field test data like standard penetration test (SPT) N value, CPT (Cone Penetration Test) values, etc., to estimate shear wave velocity or dynamic soil parameters. The relation between Vs and SPT- N values of Algiers area is predicted using the collected data, and it is also compared with the previously suggested formulas of V_s determination by measuring Root Mean Square Error (RMSE) of each model. Algiers area is situated in high seismic zone (Zone III [RPA 2003: réglement parasismique algerien]), therefore the study is important for this region. The principal aim of this paper is to compare the field measurements of Down-hole test and the empirical models to show which one of these proposed formulas are applicable to predict and deduce shear wave velocity values.

Keywords : empirical models, RMSE, shear wave velocity, standard penetration test
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