

EMPIRICAL CORRELATION OF THE DYNAMIC ELASTIC MODULI DERIVED FROM CROSSHOLE SEISMIC TESTS WITH THE VALUES OF THE STANDARD PENETRATION TEST (SPT) FOR CLAY SOILS IN SAO PAULO CITY, BRAZIL.

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Aiming for the use of the crosshole seismic testing for studies of the deformability and resistance of soil masses to small stresses, empirical linear relationships were obtained between the dynamic Young's modulus (E) and dynamic shear modulus (G) with the values of SPT. The experiment used values of SPT obtained with two different downfall heights: 0.75 m (standard) and 0.45 m. In both cases, the analysis was limited to superficial horizons (up to 11 meters depth) corresponding to porous clay. The values of SPT (N_{spt}) are linearly correlated (at the 99% significance level) with both G and E for the downfall height of 0.45 m, but E is significantly correlated with SPT data only for the downfall height of 0.45 m. It suggests that for the purpose of correlation, the standard height of the SPT (0.75 m) is not the most suitable, especially regarding the parameter E. The empirical linear formulae for the downfall height of 0.45 m, obtained by a generalized maximum likelihood estimator considering the errors in both variables are equal to: $G = 101.0 \pm 10.6 + (8.1 \pm 1.2)N_{spt}$ (in Mpa) and $E = 191.3 \pm 58.5 + (24.9 \pm 5.7)N_{spt}$ (in Mpa). The estimated parameters, their standard deviations as well as illustrations of the correlation graphs are presented along with a discussion of the procedures and equipment used in the crosshole seismic tests.