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Abstract

LABORATORY STUDY OF SHEAR WAVE VELOCITY AND VERY SMALL STRAIN MODULUS OF MACAO MARINE CLAY

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Shear wave velocity, V_s, of soft clay is an important parameter for seismic resistant design as well as for deformation analysis of earth structures as it is directly related to the very small-strain stiffness, and the measurement of V_s is a critical task in the solution of geotechnical earthquake engineering problems. In this study, piezoelectric bender elements were used to measure the shear wave velocity on both undisturbed and reconstituted specimens of Macao marine clay. Various initial stress conditions, including isotropic, constant stress ratio, η, and constant p', were simulated in the triaxial apparatus. Two signal interpretation methods, the characteristic peaks and the cross-correlation, were used to determine the arrival time for calculation of V_s. In addition, void ratio functions were assessed, and empirical expressions between the maximum shear modulus and the initial stress condition as well as the void ratio were proposed for Macau marine clay.