

Study of the Elastic Shear Modulus of Bio Bio Sand Using Bender Elements in an Oedometer

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Resumen

The objective of the paper is to study the shear stiffness of Bio Bio sand. To this end, a system to measure the travel time of shear waves in Bio Bio sand samples using bender elements was designed and setup in an adapted oedometer device. Measurements were carried out for sand samples with different relative density, pressure/deformation, diameter/height, dry/saturated and varying the frequency, amplitude, and type of the triggered electric signals. The shear wave velocity and elastic shear modulus increased with relative density and effective vertical stress as previously found by other authors. In addition, Hardin type empirical formulas for estimating the elastic shear modulus are used to compare with the experimental results. Estimations proved to be good only in loading for effective vertical stresses around 100 kPa, since underestimation and overestimation of the shear modulus occurred for stresses below and above that value, respectively. Soil shear stiffness during unloading/reloading cycles was underestimated with the expressions used for loading.

Palabras clave

Palabras clave de autor: [bender element](#); [travel time](#); [shear wave velocity](#); [elastic shear modulus](#); [unloading/reloading cycles](#)

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