

THE EQUIVALENT DYNAMIC SHEAR MODULI FOR DRY SANDS

by

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Dynamic experiments conducted on five different dry sands of different densities using the Torsional Simple Shear Device (Ref. 1) led to the establishment of the following relationships:

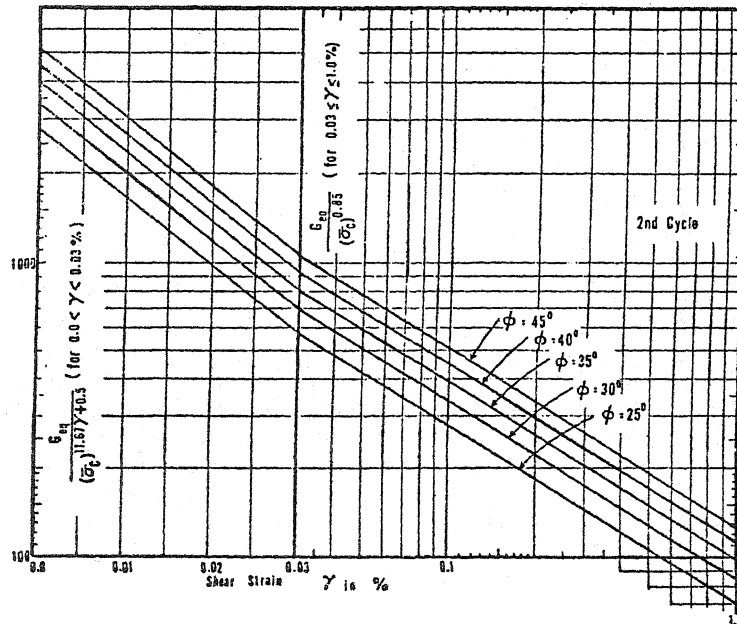
$$\text{For } 0\% < \gamma < 0.03\% : \frac{G_{eq}}{2.8\phi(\bar{\sigma}_c)^{11.67\gamma+0.5}} = 40(0.205)^{\frac{\gamma}{0.05}} \quad (1)$$

$$\text{For } 0.03\% < \gamma < 1.0\% : \frac{G_{eq}}{2.8\phi(\bar{\sigma}_c)^{0.85}} = \gamma^{-0.6} \quad (2)$$

where; G_{eq} = equivalent shear moduli in psi; ϕ = angle of internal friction for the soil; $\bar{\sigma}_c$ = effective confining pressure in psi and γ = dynamic shear strain in %.

The above relationships in equations (1) and (2) are expressed in the nomograph shown in Fig. 1.

Fig.1 Nomograph for G_{eq} Determination for Dry Sands



Ref.1 : Ishibashi, I. and M.A. Sherif, "Soil Liquefaction by Torsional Simple Shear Device", Journal of Geotechnical Engineering Division, A.S.C.E., vol. 100, no. GT8, August 1974.

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