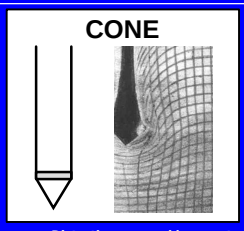
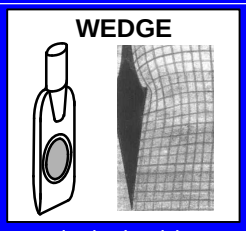
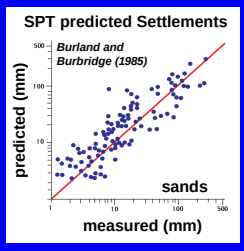
DISTORTIONS IN CLAY

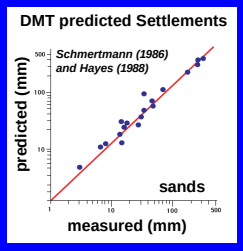




Distortions caused by penetration of cones and wedges in real clay.
Baligh & Scott (Nov. 1975) "Quasi-Static Deep Penetration in Clay",Jnl. ASCE Geot.Eng.Div.

SETTLEMENTS



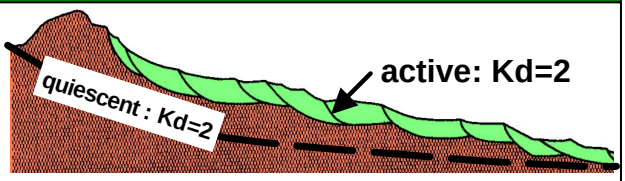


Bullock & Failmezger (Porto 2004)

Higher accuracy of DMT believed due to:

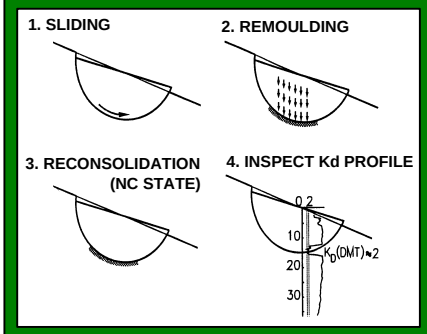
1. DMT contains information on Stress History
2. Wedge shaped tips deform less than conical tips
3. Modulus obtained by loading the soil (mini-load test) is more closely related to Modulus than Penetration Resistance

Need to detect slip surfaces ?

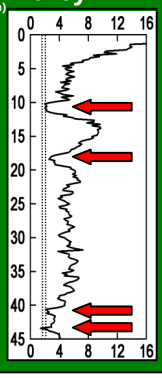


Kd = 2 ⟶ active/quiescent slip surface

Formation of Kd = 2 (NC) zones



Kd by DMT



Kd = 2 denotes NC clay

LIQUEFACTION by SEISMIC DILATOMETER

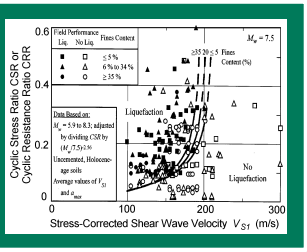
Two independent CRR evaluations

CRR from Vs_{SDMT}

$$CRR = \left[0.022\left(\frac{K_{s1}V_{S1}}{100}\right)^2 + 2.8\left(\frac{1}{V^*_{S1} - K_{s1}V_{s1}} - \frac{1}{V^*_{S1}}\right)\right]K_{\alpha 2}$$

Andrus and Stokoe 2000

Light earthquakes

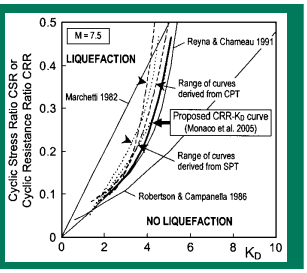


CRR from Kd_{DMT}

$$CRR = 0.0107\,K_D^3 - 0.0741\,K_D^2 + 0.2169\,K_D - 0.1306$$

Monaco 2005

Strong earthquakes



Ref. Monaco (2007) "Evaluating Liquefaction Potential by Seismic Dilatometer (SDMT) accounting for Aging/Stress History" 4th Int. Conf. Earthquake Geotechn. Eng. - Thessaloniki

www.marchetti-dmt.it

NO JACKUP