

Discussion of “CPT-DMT Correlations” by P. K. Robertson

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Roger Failmezger, F.ASCE¹

¹Principal, In-Situ Soil Testing, L.C., 1626 Corrotoman Dr., Lancaster, VA 22503. E-mail: roger@insitusoil.com

The goal of every geotechnical engineer should be to provide the most accurate yet safe design possible. The engineer must minimize uncertainties and determine parameters accurately (Failmezger et al. 2004). Every correlation is an approximation of the desired parameter—approximations lead to higher project costs (Mizra 1998). The CPT is a model of a pile and provides an accurate prediction of the vertical capacity of a pile (Bustamante and Ganeselli 1982). The DMT is a deformation test and provides an accurate prediction of settlement (Monaco et al. 2006; Schmertmann 1986). The DMT is also a lateral test and provides an accurate prediction of the horizontal capacity of a pile (Crapps 2006; Marchetti et al. 1991; Robertson et al. 1989).

If an engineer uses CPT data to make a settlement or a lateral load capacity of a deep foundation prediction on the basis of DMT equations, an additional and unnecessary layer of uncertainty is included in that prediction. It is difficult to get a deformation modulus from one number—at least two points on a stress-strain curve are needed. Similarly, if an engineer uses DMT data to make a vertical load capacity of a deep foundation prediction on the basis of CPT equations, additional unnecessary uncertainty is added.

Both tests use the same equipment to advance the probes into the soil. The engineer should select the appropriate test (probe) for the design needs (Failmezger and Bullock 2008). Don’t use a chisel (crude test) when you need a screwdriver (precise test)!

The proposed equations are based on a worldwide data set. These equations can be refined if applied to local geologic formations. The equations can serve as a valuable guide for local or site-specific correlations. Statistical parameters, such as the coefficient of variation and the correlation coefficient for the proposed equations, would be helpful to evaluate uncertainty.

For ground improvement sites that require a higher deformation moduli for the soil, a combination of CPT and DMT is likely the best solution (Schmertmann et al. 1986). With site-specific

correlations, the CPT can be used to identify areas that are clearly improved enough and areas that are marginal. The DMT can then be used for the marginal areas to determine the soils’ deformation moduli more accurately.

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