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Compressive and shear strength as quality control for some soil materials at different depths, Nile Delta, Egypt.

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Clay soils can present great problems in foundations due to their susceptibility to changes in moisture content. Repeating of wetting and drying out may destroy the soil structure. The quality control of the behavior of soil materials beneath any foundation can be estimated using a sonic wave technique. Compression and shear-wave velocities can be determined within the soil at different depths.

This paper describes a sonic based testing methodology for quality control of soil materials at varying depths, Nile Delta, Egypt. Sonic and shear strength of the soil under investigation were tested. The sonic test showed considerable variation with depth. Compression and shear-wave velocities were used to evaluate the strength gain of soil at different depths. The characteristics of soil materials were estimated using X-ray diffraction (XRD), scanning electron microscopy (SEM) and electron dispersive X-ray analyses (EDX). The relation between engineering properties of soil materials and petrological characteristics was also investigated. This allowed for a qualitative interpretation of the clay content of the soils and improved the understanding of the effect of clay on the engineering behaviour of soils within the Nile Delta.

