Cone Penetration Testing[1]

The cone penetration test (CPT) consists of hydraulically pushing a metal cone of specific dimensions into the ground. The CPT borings were performed using an integrated electronic cone system. The cone method used was designed in accordance with ASTM D 3341-94 having a tip area of 10 cm^2 and a sleeve friction area of 150 cm^2. The peizometer element consists of a 5 mm plastic porous element located immediately behind the cone tip. The cone utilized during this exploration is capable of measuring tip resistance, sleeve friction and dynamic pore pressures. Soil resistance at the cone tip and sleeve are measured by electronic sensors. The cone resistance, q_c, is the total force acting on the cone divided by the projected area of the cone; and the side friction, f_{sc}, is the total frictional force acting on the sleeve divided by its surface area. Data is typically expressed in terms of the friction ratio, R_f (f_{sc}/q_c x 100). Tip and sleeve values can be used to estimate soil properties and soil classification. Additional sensors can measure changes in pore pressure within the soil caused by the penetration of the cone. Pore pressures dissipation measurements were conducted at internals, which were noted to have an increase in the in-situ pore pressure during the real time soil property measurements of the cone.

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[1] Jefferies, M. G. and Davies M. P. (1993), "Use of CPT to Estimate Equivalent SPT N_{60}", Geotechnical Testing Journal , Philadelphia, Pennsylvania.

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