GEOSTATISTICAL ANALYSIS OF SPATIAL VARIABILITY OF A CLAY DEPOSIT

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ABSTRACT

The identification of layer boundaries and demarcating the soil profile into homogeneous layers are often much more complicated than one expected when dealing with highly variable complex natural material. The quantitative approaches reported in geotechnical literatures are limited, varies and mostly restricted to case or project specific basis. In this study, the performance of two statistical methods, namely intraclass correlation coefficient (RI) and Bartlett test statistic in conjunction with various suggested window widths are investigated using three fairly different CPT soundings obtained from the database at National Geotechnical Experimental Sites. RI appears to be a more powerful, robust and persistent tool and the corresponding suitable window width was proven as a function of average distance between boundaries which could be determined from autocorrelation analysis. Autocorrelation analysis is relatively complex and time-consuming, thus a simple approximate method is proposed to estimate the suitable window width using the concept of average distance between 'mean-crossings'. The approach was exploited and substantiated as a simple, quick and accurate estimator in making the first approximation on suitable window width for boundaries identification exercise.