

**Correlation between soil penetrometers test data for analysis and design of foundations
under local conditions in Tanzania**

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Both the Standard Penetration Test (SPT) and the Dynamic Cone Penetration Test (DCPT) have been carried out in Tanzania for many years. Data obtained from these tests are used for analysis and design of foundations. While SPT is popular, it involves drilling whereby samples can be recovered for further laboratory testing. The DCPT has the advantage of being less expensive and less time consuming.

Besides the advantages, SPT test results are sensitive to test details and procedures and DCPT is not universally standardized. In spite of the fact that the aforementioned disadvantages are known, consulting firms in Tanzania still design foundations using SPT correlations that are not adjusted to suit the local soil conditions, equipment and test procedure. This research is concerned with formulation of relationship between the penetrometers test data under local Tanzanian practices and soil types.

Data from five geotechnical investigation projects performed by experienced consultants were used to formulate correlations where a total of 40 boreholes and 37 DCP tests were involved. Following the analysis, it was observed that SPT values can be correlated with DCPT values, soil bearing resistance and also with vertical overburden stress.

Correlations developed in this study are suitable to the specific soil types and equipment used. There is therefore a need of formulating a universal relationship that takes into account the many factors that can influence the penetrometers data and also the relationship that can be useful for any soil type.