



UNCONFINED COMPRESSION STRENGTH AND POINT LOAD INDEX FOR SELECTED BASALTIC ROCK

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ABSTRACT

Determination of rock strength is vital in the applications of geotechnical engineering. Unconfined Compressive Strength (UCS), also known as Uniaxial Compressive Strength (UCS), is one of the most important strength properties of rocks. Because of the time it consumes and the higher cost; the UCS is usually compared to strength obtained by Point Load Test (PLT) which is practically used to determine the rock strength index ($I_{s(50)}$). Despite the fact that the Uniaxial Compressive Test (UCT) is time-consuming and costly, it is not always possible to conduct the UCT on rock samples, specifically, for highly weathered rocks. Correlations that associate the uniaxial compressive strength UCS with the strength obtained from the simpler and faster test known as point load test (PLT), and expressed as Point load Index ($I_{s(50)}$), exist in the literature. Most of the existing correlations have been developed for a huge variety of rock regardless its type. The majority of the existing correlations ended up with quite closer conclusions that indicate the UCS values are approximately within the range of 24 times the point load index ($I_{s(50)}$).

However, it is well known that even for the same rock type correlation may change if the site being tested is changed. This may also be explained by the slight difference in the formation and occurrence of a certain rock type. For Al-Mafraq district Basalt rock, there is little well-documented research findings in the literature that correlates the Uniaxial compressive strength UCS and the Point Load Index PLI ($I_{s(50)}$). Therefore, this study has been carried out to estimate the indirect procedures of assessing the uniaxial compressive strength (UCS) of specific rock types by correlating the UCS with the PLI. In this work, Basalt rock samples collected from the Al-Mafraq area were considered in order to evaluate the possible correlation between the UCS and PLI.

Based on the results of this work, the (UCS) was found to be correlated with ($I_{s(50)}$) through a linear relationship having a correlation constant of 21.4.

Keywords: uniaxial compressive strength; point load test; rock; point load index