ABSTRACT

The safety of any construction depends significantly on the type of foundation/substructure it rests on. The nature of existing sub-soil conditions at a particular construction site plays a crucial role in the choice of foundation. One of the most important properties of soils is its shear strength. In this study a laboratory investigation to evaluate creep characteristics and shear strength parameters (c, φ) of remoulded (artificially consolidated) inorganic and organic clay using triaxial compression and multistage triaxial creep tests was conducted. An attempt has been made to investigate the variations in magnitude of shear strength parameters (c, φ) due to difference in testing procedures and drainage conditions in order to predict the realistic and most appropriate (c,φ) values for evaluating soil strength for construction, estimating the creep potential and creep parameters of soft clays of Normal Kolkata Deposit. For this purpose conventional triaxial compression and multistage triaxial creep tests under undrained and drained conditions on remoulded inorganic and organic clays of Normal Kolkata Deposit have been conducted. The creep potential and creep parameters of soft clays of Normal Kolkata Deposit have been estimated using the triaxial test data. The compression behaviour of natural clays and remoulded clays have been compared using available data from oedometer tests conducted on natural and remoulded clays of this region. The results indicate that for natural and remoulded clays of Kolkata region the compression behaviour and parameters governing compression behaviour are similar and that the effect of soil fabric in case of Kolkata clays is not prominent at all. The effective friction angles obtained from undrained tests are quite higher than that obtained from drained tests, 4-6º and 5-8º for inorganic and organic clays respectively. The maximum deviator stress and also effective friction angle obtained from stress-controlled undrained tests are higher than those obtained from strain-controlled undrained tests for both inorganic and organic clays. The creep potential calculated using Singh and Mitchell (1969) parameters revealed that under undrained conditions the effect of time dependent evolution of

behaviour was evident for inorganic and organic clays. Under drained conditions the effect of creep was not as significant as evidenced during undrained tests.

Keywords: Normal Kolkata Deposit, Strain-controlled tests; stress-controlled tests;, Singh and Mitchell (1969), creep , undrained tests, effective friction angle, drained tests.