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Investigation of empirical correlations for compression index for Sri Lankan organic and inorganic soft soils using a relational database

Excessive settlement of structures and subsequent correction procedures has become a major concern for both the public and the engineering community during last few decades due to frequent use of soft grounds for infrastructure development. To prevent such post construction problems associated with excessive settlement, it is essential that the expected settlement of foundation constructed on soft grounds is predicted prior to construction. A main factor that prevent even a qualified engineer from estimating the expected settlement of a foundation on soft ground is the high cost involved with such design due to expensive soil tests required and extreme difficulty associated with sampling of soft soils.

If already available test results could be used to estimate the required parameters with a reasonable confidence using index properties of soft soils, the design procedure could be made more attractive. With the above task in mind, a relational database is designed to store soil lab test results. The developed database is used to investigate the empirical correlations for compression index which is an important soil compressibility parameter used to estimate 1-D consolidation settlement of soft layers. Laboratory estimation of compression index requires undisturbed sampling and time consuming oedometer test. There are large number of empirical correlations available to estimate compression index from soil index properties. It is attempted here to investigate the applicability of these correlations for Sri Lankan organic and inorganic soft soils. After analysis of the test results available at present, it was evident that the most of the empirical correlations are valid for Sri Lankan soils but in most cases with different constants and constants of proportionality. A case study carried out has demonstrated the practical applicability of this method already.