

C-39: A pilot study on the establishment and use of a geotechnical database for Sri Lanka

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An adequate knowledge of soil formations and their properties is an essential requirement for the safe and economic design of civil engineering structures and for finding satisfactory solutions to geotechnical problems. There are many government and private sector organizations involved in site investigation and soil testing in Sri Lanka. However, in the absence of a geotechnical database, it is not possible to use these data effectively.

A pilot study has been undertaken to establish a geotechnical database for Sri Lanka. Geotechnical data from 25 projects in the Central Province, available in the Soil Mechanics Laboratory University of Peradeniya have been used to form the pilot database. Microsoft Access was used to establish the database records. Geotechnical representation of the data has been carried out using GIS software such as Arc View and Arc/Info. Microsoft Excel spreadsheet program has been used to analyse the relationships between classification properties of the soils in the database.

The data from the 25 projects were entered into the Access program in the form of a series of interlinked tables. The tables contain data on projects, the location, borehole data, sampling points, tests conducted and test results. 1 : 50,000 map of Central Province has been digitized for use with GIS software ArcView and ArcInfo.

Using the Access pilot geotechnical database, a user can get details of a particular project and other relevant data on boreholes sampling and testing.

Using the ArcView a user can identify past projects or boreholes in a specified area or a location on visual display. By clicking the mouse at a target point on the visual display, the user can also obtain specific data on boreholes at the location.

The analysis carried out on limited classification data from Central Province using Microsoft Excel spreadsheets indicated that a strong correlation exists between the plasticity index and Atterburg limits of the soils. This may be an indication of the presence of a single dominant clay mineral probably kaolinite. However the correlation between other classification properties has been rather poor.

A pilot geotechnical database has been successfully established using software packages Access, Excel, Arc View and Arc/Info. The results of the pilot study indicated the usefulness of the method and how it can be expanded to include additional data and can also be extended to cover the whole of Sri Lanka.