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Collection and analysis of physical properties of rocks for enhancing the geotechnical database KuniJiban

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The geotechnical database KuniJiban of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has more than 75,000 data of the boring logs and laboratory soil tests as of April 2010. However the laboratory test data registered in it are mainly those for unconsolidated soils, not many for rocks. Therefore we have started to collect and digitize the laboratory test data for rocks obtained in investigations for dams and tunnels conducted by MLIT in the past.

Before starting digitization of the data, we have studied the information and data to be registered referring to existing databases. Main physical properties of rocks decided to be registered include ultrasonic P- and S-wave velocities, and deformability and strength measured by uni-axial and tri-axial compression tests, as well as the basic physical properties such as density, water content, porosity and magnetic susceptibility of the rock. The information on the location and geology of the core sampling site is also registered. Approximately 1,600 data obtained mainly in investigations at the dam sites has been so far digitized.

To check the quality of each digital measurement data, major physical properties of P- and S-wave velocities, dynamic and static deformability, and unconfined compressive strength are cross-plotted against each other and also compared to other datasets. This check indicates that most digitized data are high in quality enough for further analysis.

Keywords: database, KuniJiban, physical properties of rocks, laboratory rock test