

Analysis of Engineering Geological Characteristics of Soft Ariake Clay due to Affection of Quaternary History

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The geological location of Japan, situated to the east of the Eurasian continent, is formed by a long chain of islands are extending in a north-northeast direction between the latitudes of 24° and 46°. The total country area is about 480,000km². Almost 85% of it is mountains so that prone to landslides.

The Saga plain of Kyushu Island of Japan is a lowland area that facing to Ariake Sea in south and surrounded by mountains in north, west and east directions. It consists of Quaternary soft deposits around the big inland Ariake Sea and shows great variation in material thickness, sensitivity, and softness. The top clayey soil is generally 10 to 20 meters thick with a maximum of 30 meter. Clay minerals in Ariake clay are montmorillonite, illite, hydro-halloysite and metahalloysite with a lot of diatom remains.

Quantitative correlation by soil tests were made in each geographical location. The engineering geological characteristics of the region were revealed by the analysis of the spatial database in aspect of horizontal expanse, geological accumulation, hinterland geology and fundamental mass movement processes. It was concluded that two parallel faults and mass movement affected by the Philippine plate caused thick accumulation of Quaternary layers. Historically, the geology of the hinterland was influenced by the past pyroclastic flows of the old Aso Volcano during Pleistocene time. The transgression and regression processes had affected the thick soft Ariake deposit. A wide Ariake sea with a small mouth resulted in a big tidal range and special current patterns.