

2. Effects of Temperature on the Consolidation and Consistency of Clayey Soil - Consideration of Elemental Experiments Using Various Clayey Soil -

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This study focuses on the effects of temperature on the consolidation and consistency of clay to verify the applicability of thermal consolidation acceleration methods for soft clay ground using renewable energy. As is well-known, higher temperatures can accelerate the consolidation of clay. However, the extent of this effect has yet to be generalized to a wide range of clay types. This study entailed a series of one-dimensional consolidation tests at different temperatures (17, 23, 35, 50, 65°C) using two specimens of processed clay and three specimens of natural clayey soil dredged from ports. To evaluate the effects of temperature on soil consistency, which can affect consolidation behavior, we evaluated consistency limits for the clay at different temperatures. The results confirmed that while the temperature effects on consistency limits varied depending on the type of clay, the consolidation coefficient increased with increase in temperature for all clayey soil types. The results also confirmed that change in viscosity of the pore water with temperature rise significantly boosted the consolidation coefficient and that the consolidation coefficient is strongly correlated with the activity of the clayey soil.

Key words: consolidation, consistency, temperature effects, consolidation acceleration method