

# Study on Soil Stabilization Using Natural Rubber Latex for Road Construction in Sri Lanka

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## Abstract

Soil stabilization technology is extremely important to the road construction industry. In order to utilize the local soil resources effectively, soil stabilization can be adopted in the construction of the roads. However, the traditional soil stabilization techniques cannot be applied for all types of soil, as environmental impacts are considerably high. Therefore, an investigation was carried out to use natural rubber latex as a stabilizer and its ability to increase the bearing capacity of the soil, which is an indicator of the strength characteristics. This research focuses on the effects of the treatment on the physical properties of soil. For this research, Clayey Sand (SC) type of soil from a highway construction site was used. Preserved field latex was selected due to its low cost, low viscosity and non-toxicity when compared to other types of latexes. Further, air curing and oven dry curing methodologies were adopted for the soil-latex mixed samples during the CBR testing. Additionally, oven dry curing samples were analysed in soaking and non-soaking conditions in this research. In the soaking condition, the California Bearing Ratio (CBR) of the soil reduced drastically in comparison to the non-soaking condition, but it was higher than the CBR of normal soil at 3% of dry rubber content. Optimal percentage of latex to be used was selected by adding 2%, 3%, 4% and 5% of dry rubber content to the soil. The stabilized soil yielded the highest maximum dry density and CBR values for 3% of the dry rubber content. With the increase of latex more than 3%, the maximum dry density and CBR values showed a reduction because the increase in latex content leads to a reduction in the bond between soil particles. Validation was carried out using hypothesis testing, and statistics analysis was used to estimate the improvement rate. Even though there are benefits in this research method, few limitations exist in the application to the road construction in Sri Lanka.

**Key words:** Soil stabilization, Natural rubber latex, Road construction, Soaking, Curing method

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