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TITLE OF PROJECT: **Salt Effect on Shrinkage Behavior of Bentonite Clay**

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ABSTRACT: The behavior of bentonite clay (BC) becomes very complex when it interacts with water or aqueous solution. During last few years, numerous scientific studies have been conducted on volume change characteristics of BC in presence of different types of additives. However, the effect of salt on swelling-shrinkage behavior of BC has rarely been investigated. The prime objective of the current study is to evaluate the salt effects on the swelling and shrinkage behavior of bentonite clay. The study analyzed the test results of free swelling index (FSI), Plasticity index (PI), shrinkage index (SI), shrinkage ratio (SR), volumetric shrinkage (VS) and linear shrinkage (LS) for five different mixes prepared by adding 1%, 2%, 3%, 4% and 5% of either black salt or white salt with respect to 100 g of dry bentonite clay. The analyses indicate a consistent fall in the FSI, PI, SI, SR, VS and LS of bentonite clay with the incremental addition of salt quantity. It might be attributed to the change in the physicochemical properties such as osmotic potential of BC in presence of salt. The rate of fall in these BC parameters is more pronounced in case of black salt, which might be because of its available tracing elements. Thus, the study reveals a salt induced reduction in volumetric instability triggered by clay-water interaction. The outcome of the study might help in understanding the real field scenarios where controlled swelling of bentonite clay is desirable in presence of aqueous solution of salt.

KEYWORDS: Salt effect, Shrinkage characteristics, Bentonite clay

CATEGORY: Geotechnical Engineering