

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM



**STUDIES ON FREE SWELL BEHAVIOUR OF MIXTURES OF CLAY
MINERALS UNDER VARYING PORE MEDIUM CHEMISTRY**

A project report submitted in partial fulfillment for the award of the degree of
BACHELOR OF ENGINEERING IN CIVIL ENGINEERING

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Abstract

Natural soils almost always occur as mixes of various minerals, both clay and non-clay. While many studies have been carried out on pure clay minerals, the behaviour of mixes of these pure clay minerals has not been thoroughly investigated. Due to increasing soil pollution, there is increasing probability of soils coming in contact with liquids other than water. The response of soils in these varying chemical environments requires to be studied.

In the present experimental work, the free swell behaviour of mixes of pure clay minerals, namely, kaolinite and bentonite, in different proportions has been studied under varying pore medium chemistry, with dielectric constant, cation concentration and cation valency as the variables. Free swell ratio has been employed to classify the soil mixes based on their expansivity. It is hoped that the results throw some light on the free swell behaviour of the soil mixes exposed to different pore media, which may be of use in the field of geotechnical and geo-environmental engineering.