

Vertical swelling of expansive soils under fully and partially lateral restraint conditions

M.A. Al-Shamrani & A.I. Al-Mhaidib

Department of Civil Engineering, King Saud University, Riyadh, Saudi Arabia

ABSTRACT: This paper presents the results of an experimental investigation in which the feasibility of using a stress path triaxial cell for evaluating the vertical swell of expansive soils under multi-dimensional loading conditions was examined. Series of triaxial swell tests were conducted, and the influence of confinement and initial water content on the predicted vertical swell was evaluated. The results of these tests were compared with the volume changes observed for samples tested under identical initial conditions in the oedometer. The vertical swell linearly decreased with increasing confining pressure and initial water content. The percentages of ultimate vertical swell obtained from triaxial swell tests were considerably lower than the corresponding values measured in the oedometer tests. Besides, the rate of decrease in the vertical swell with increasing applied pressure is higher for the oedometer tests.