



ABSTRACT

Expansive soils are a soil with the swell of high-shrinkage. There are 2 types of swelling in expansive soil movement is lateral and vertical swelling. Swelling test in the laboratory is often done in a restrictive ring with lateral direction so that no swelling deformation in horizontal direction. The purpose of this study was to determine the of the swell of vertical and horizontal and influence of confined pressure membrane of the swell soils by used test membrane is not rigid (elastic).

Swell tests conducted on the variations of the specimen diameter of 4,5 cm and 5.7 cm, the variation in the levels of wopt = 31,12% and 21%, the pressure variation vertical (pv); 1 kPa, 3,5 kPa and 6,9 kPa, variations in sample height (h0); 2 cm and 2.5 cm and variations in membrane thickness (t) of 0,7 mm and 0,5 mm. Strain the axial direction is measured with a dial gauge mounted vertically parallel while the lateral strain is measured by measuring changes in diameter of the specimen with a digital caliper measurement tools.

The results showed that the clay Ngawi an expansive clays with high swell potential. The maximum axial and lateral strain respectively - were caused by the influence of the initial moisture content is $\pm 16\%$, lateral 25.5%, due to the high leverage and the sample diameter is 12, 5% and 26%, due to the influence of membrane thickness is 14% and 23% and due to the influence of strain lateral vertical pressure is 10% greater than the axial strain and 40% of the volumetric strain.

Keywords: Vertical pressure, strain, confined pressure membrane.



INTISARI

Tipe-tipe gerakan pengembangan pada tanah ekspansif ada dua yaitu gerakan pengembangan arah lateral dan vertikal. Uji pengembangan di laboratorium, sering dilakukan pada ring yang terkekang arah lateral sehingga tidak ada deformasi kembang arah horizontal. Tujuan penelitian ini adalah untuk mengetahui besarnya regangan pengembangan tanah arah aksial dan lateral serta tekanan kekang membran (tekanan lateral) terhadap pengembangan tanah.

Pengujian pengembangan ini dilakukan pada variasi diameter benda uji yaitu 4,5 cm dan 5,7 cm, variasi kadar pada $w_{opt} = 31,12\%$ dan 21% , variasi tekanan vertikal (p_v); 1 kPa, 3,5 kPa, dan 6,9 kPa, variasi tinggi sampel (h_0); 2 cm dan 2,5 cm dan variasi ketebalan membran (t) 0,7 mm dan 0,5 mm. Regangan arah aksial diukur dengan *dial gauge* yang dipasang sejajar vertikal sedang regangan lateral diukur dengan mengukur perubahan diameter benda uji dengan alat ukur *caliper digital*.

Hasil penelitian menunjukkan bahwa tanah lempung Ngawi merupakan lempung ekspansif dengan potensi pengembangan yang tinggi. Regangan aksial dan lateral maksimum berturut – turut terjadi akibat pengaruh kadar air awal yaitu $\pm 16\%$, lateral $25,5\%$, akibat pengaruh tinggi dan diameter sampel adalah $12,5\%$ dan 26% , akibat pengaruh tebal membran yaitu 14% dan 23% , dan akibat pengaruh tekanan vertikal adalah regangan lateral 10% lebih besar dari regangan aksial dan 40% dari regangan volumetrik.

Kata kunci : Tekanan vertikal, regangan, tekanan kekang membran.